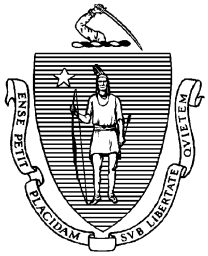
The Environmental Performance Partnership Agreement:

Final Progress Report on the Federal Fiscal Year 2003 Performance Partnership Agreement 10/01/2002 – 9/30/2003

Massachusetts Department of Environmental Protection
February 2004



This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

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Introduction

What is this report?

This is a report on the progress made in federal fiscal year 2003 (October 1, 2002-September 30, 2003) towards the environmental goals and milestones included in the *Environmental Performance Partnership Agreement: 2002-2003* between the Massachusetts Department of Environmental Protection and the Environmental Protection Agency New England. The *Agreement* was developed as part of the National Environmental Performance Partnership System.

What is the context for this report?

The National Environmental Performance Partnership System (NEPPS) was designed to establish a new approach to the federal-state relationship in environmental protection. Its intent was to develop a system that was based upon environmental goals and measures of success and allowed states maximum operating flexibility to accomplish their environmental priorities. It also promised less federal oversight of state programs that have demonstrated strong performance and capability.

Key features of this system include:

- Environmental Performance Partnership Agreements and Grants that replaced traditional media-specific grants, and
- Increased use of environmental goals and indicators.

What information does it include?

This report includes some information for the federal fiscal years (FFY) of 2001, 2002 and 2003 and more detailed information for FFY 2003. Information is organized by environmental goal and includes:

- Highlighted activities in FFY 2003
- Environmental indicators and other performance measures reported for FFY 2001, 2002, and 2003,
- Three year trend analysis for each environmental goal, and
- References to other FFY 2003 work products.

This report also includes information on 2001-2003 inspections and enforcement.

Data are collected and organized for 3 different time periods: federal fiscal year (10/1 to 9/30); state fiscal year (7/1 to 6/30); and calendar year (1/1 to 12/31). DEP uses data for the closest possible complete year. DEP has indicated any variation from the federal fiscal year in the report.

What kind of indicators and performance measures are in this report?

This report includes:

- State-specific indicators and measures developed by MA DEP, and
- Core Performance Measures (CPMs) required by EPA.

What are Core Performance Measures?

CPMs are a limited set of national measures, designed to help gauge progress towards protection of the environment and public health. They include a mix of three types of measures needed to understand environmental programs and their effectiveness:

- Environmental indicators (high level trends describing environmental and public health conditions)
- Outcomes (measures of program influence or effect), and
- Outputs (measures of program activities).

The CPMs initially developed in 1998 changed in 1999 and 2000, reflecting a transition in the shift of emphasis to outcome-based measures. A continued joint effort will be needed to bring these measures increasingly closer to an accurate and useful reflection of the most important environmental and program outcomes.

When will the progress in 2004 be reported?

DEP will provide a mid-year update for 2004 (for the dates 10/1/03 through 3/31/04) by July 2004. An annual update for FFY 2003 will be provided by January 2005.

Clean Water Operational Goal #1: Ensure that every public water supply consistently provides water that is safe to drink

What needs to be done

- Protect water supply sources.
- Treat water, if required, prior to distribution.
- Protect and maintain water distribution systems.
- Monitor public water supply systems to ensure provision of safe drinking water.
- Ensure public water supply systems are operated and managed well.
- Increase public awareness about safe drinking water.
- Incorporate new federal primacy requirements.

2003 Highlights in meeting goal

In 2003, DEP had several successes in advancing this goal. These included:

- Ensuring that all PWSs have certified operators, approved distribution protection plans, and Source Water Assessments, which contributed to the continued high compliance rates with health-based standards.

DEP conducted these training or outreach sessions:

- 3 Water Management Act Program outreach events;
- 3 Source Protection training/outreach sessions;
- 3 annual Distribution Protection-Cross Connection Training and Outreach workshops;
- 12 lectures on Cross Connection regulations at NEWWA Backflow Tester and Cross-connection Survey courses;
- 3 training for city officials regarding the Cross Connection program in Cambridge, Waltham, and Newton.

Environmental Indicators and other Performance Measures

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
# and % of community and non-transient non-community water systems (and population served) with one or more violations of health-based requirements during the year, reported separately for violations of the Total Coliform Rule (TCR), Radionuclides, chemical contaminants, Lead and Copper Rule (LCR), Surface Water Treatment Rule (SWTR), and all other regulated contaminants ***See note on next page.***	[Reporting data in this format is not required in 2001. See next row.]	[Reporting data in this format is not required in 2002. See next row.]	[Reporting data in this format is not required in 2003. See next row.]

FFY = Federal Fiscal Year. When data isn't compiled by federal fiscal year, the closest possible complete year is used.
‡ Outcomes marked with this symbol are Core Performance Measures.

# of: a) community drinking water systems and % of population served by community water systems, and b) non-transient, non-community drinking water systems and % of population served by such systems, with no violations during the year of any federally enforceable health-based standard (EPA will develop language clarifying meaning of "federally enforceable") ‡	**For Community and Non-transient non-community systems (NTNC) only** **TCR: Community** ➢ Acute MCL – 507 systems serving 98% population ➢ Monthly MCL – 480 systems serving 93% population **TCR: NTNC** ➢ Acute MCL – 229 systems serving 99% populatin; ➢ Monthly MCL –218 systems serving 96% population **Nitrate: Community** 514 systems serving 100% population **Nitrate: NTNC** 230 systems serving 100% population **Nitrites: Community** 514 systems, 100% population **Nitrites: NTNC** 230 systems, 100% population **Radiological: Community** 514 systems, 100% population **Radiological: NTNC** N/A **IOC: Community** 514 systems, 100% population **IOC: NTNC** 230 systems, 100% population **TTHM: Community** 513 systems, >99% population **TTHM: NTNC** N/A **SOC: Community** 514 systems, 100% population **SOC: NTNC** 230 systems, 100% population **VOC: Community** 514 systems, 100% population **VOC: NTNC** 230 systems, 100% population	**For Community and Non-transient non-community systems (NTNC) only** **TCR: Community** ➢ Acute MCL – 508 systems serving 91% population ➢ Monthly MCL – 478 systems serving 94% population **TCR: NTNC** ➢ Acute MCL – 247 systems serving 99% population; ➢ Monthly MCL – 245 systems serving 97% population **Nitrate: Community** 515 systems serving 100% population **Nitrate: NTNC** 249 systems serving 99% population **Nitrites: Community** 515 systems, 100% population **Nitrites: NTNC** 250 systems, 100% population **Radiological: Community** 515 systems, 100% population **Radiological: NTNC** N/A **IOC: Community** 515 systems, 100% population **IOC: NTNC** 250 systems, 100% population **TTHM: Community** 515 systems, 100% population **TTHM: NTNC** N/A **SOC: Community** 515 systems, 100% population **SOC: NTNC** 250 systems, 100% population **VOC: Community** 514 systems, >99% population **VOC: NTNC** 250 systems, 100% population	**For Community and Non-transient non-community systems (NTNC) only** **TCR: Community** ➢ Acute MCL – 502 systems serving 98% population; ➢ Monthly MCL – 474 systems serving 95% population. **TCR: NTNC** ➢ Acute MCL – 249 systems serving 99% population; ➢ Monthly MCL – 234 systems serving 91% population. **Nitrate: Community** 513 systems serving 100% population. **Nitrate: NTNC** 248 systems serving >99% population. **Nitrites: Community** 512 systems serving >99% population. **Nitrites: NTNC** 250 systems, 100% population. **Radiological: Community** 513 systems, 100% population. **Radiological: NTNC** N/A **IOC: Community** 513 systems, 100% population. **IOC: NTNC** 250 systems, 100% population. **TTHM/HAA5: Community** 512 systems serving >99% population. **TTHM/HAA5: NTNC** N/A **SOC: Community** 513 systems, 100% population. **SOC: NTNC** 250 systems, 100% population. **VOC: Community** 512 systems serving >99% population. **VOC: NTNC** 250 systems, 100% population.

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‡ Outcomes marked with this symbol are Core Performance Measures.

# of: a) community drinking water systems and % of population served by community water systems, and b) non-transient, non-community drinking water systems and % of population served by such systems, with no violations during the year of any federally enforceable health-based standard (EPA will develop language clarifying meaning of "federally enforceable") ‡ **(cont.)**	**LCR: Community** 506 systems serving 97% population **LCR: NTNC** 229 systems serving >99% population **SWTR: Community** 156 systems serving >99% population **SWTR: NTNC** 2 systems serving 100% population	**LCR: Community** 494 systems serving 97% population **LCR: NTNC** 249 systems serving 99% population **SWTR: Community** 160 systems serving >99% population **SWTR: NTNC** 2 systems serving 100% population	**LCR: Community** 494 systems serving 96% population. **LCR: NTNC** 249 systems serving 99% population. **SWTR: Community** 165 systems serving 99% population. **SWTR: NTNC** 2 systems serving 100% population.
# of waterborne disease outbreaks (*Cryptosporidium, Giardia, enteric virus and bacteria*)	No outbreaks.	No outbreaks.	No outbreaks.

Outcomes	**FFY 2001**	**FFY 2002**	**FFY 2003**
Estimated number of community water systems (and estimated % of population served) implementing a multiple barrier approach to prevent drinking water contamination (EPA and States will expeditiously define "multiple barrier approach")‡	514 community public water systems (100%) have multiple barriers (more than 1 barrier) to prevent drinking water contamination. Multiple barriers may include source protection, source water assessments (SWAP), treatment, (including disinfection), distribution protection, adequate capacity and certified operators. Specific tabulations for each of these barriers are included elsewhere in this report. Program descriptions, policies and standard operation procedures for each of these barriers were previously provided to EPA.	515 community public water systems (100%) have multiple barriers (more than 1 barrier) to prevent drinking water contamination. Multiple barriers may include source protection, source water assessments (SWAP), treatment, (including disinfection), distribution protection, adequate capacity and certified operators. Specific tabulations for each of these barriers are included elsewhere in this report. Program descriptions, policies and standard operation procedures for each of these barriers were previously provided to EPA.	511 community public water systems (>99%) have multiple barriers (more than 1 barrier) to prevent drinking water contamination. Multiple barriers may include source protection, source water assessments (SWAP), treatment (including disinfection), distribution protection, adequate capacity, and certified operators. Specific tabulations for each of these barriers are included elsewhere in this report. Program descriptions, policies, and standard operation procedures for each of these barriers were previously provided to EPA.
# and % of systems with approved distribution protection plans‡	514 Community systems (99.4%). 231 NTNC systems (98.3%). 891 TNC systems (96.9%).	515 Community systems (>99%) 245 NTNC (98%) 896 TNC (97%)	516 Community systems (100%); 247 NTNC (99%); 898 TNC (98%).
# and % of systems with boil orders for bacteria that are returned to compliance	One system out of 1, 640 (0.1%)	Five systems out of 1, 683 (0.3%)	Five systems out of 1,681 (0.3%)

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Outcomes	FFY 2001	FFY 2002	FFY 2003
# of newly identified systems with MCL violations ***See note below.***	1 system (TNC, Monthly MCL violation for TCR)	None.	1 system (TNC, Monthly MCL violation for TCR)
# and % of systems exceeding the lead action level	17 systems (3%) (Community and NTNC only).	11 systems (2%) (Community and NTNC only)	13 systems (2%) (Community and NTNC only)
# and % of exceedances of the Action Level for lead resolved as a result of the DEP/DPH Referral Program for Lead Poisoned Children	No exceedance was reported in FFY2001	2 (100%)	None reported in FFY2003.
# and % of systems with improved capacity	**Community and Non-transient non-community systems:** 128 systems (18%); this includes 57 during CCE inspections, 71 that received capacity assessments with a sanitary survey and 27 systems that received SRF funding. **Transient non-community systems:** 155 systems (18%) that received CCE inspections with preliminary capacity review.	**Community and Non-transient non-community systems:** 159 systems (22%). This includes 62 during CCE inspections; 97 that received capacity assessments with a sanitary survey; and 26 systems that received SRF funding. **Transient non-community systems:** 140 systems (16%) that received CCE inspections with preliminary capacity review.	**Community and Non-transient non-community systems:** 140 systems (19%). This includes 64 during CCE inspections; 79 that received capacity assessments with a sanitary survey; and 16 systems that received SRF funding. **Transient non-community systems:** 46 systems (5%) that received CCE inspections with preliminary capacity review.
# and % of systems with certified operator	1,590 (98.7%)	1,685 (97.5%)	1,672 (99.5%)
# and % of systems who completed Consumer Confidence Reports	503 (98%).	487 (95.7%)	512 (99.6%)

Note: "Health-based requirements" were interpreted as MCL violations for TCR and nitrate, failure to install optimal treatments for LCR, failure to filter for SWTR, and MCL violations for other regulated contaminants.

Outputs	FFY 2001	FFY 2002	FFY 2003
# of Comprehensive Compliance Evaluations (CCEs)	57 CCE surveys were completed.	63 CCE surveys were completed.	64 CCE surveys were completed.
# of sanitary surveys	283 sanitary surveys were completed, including 6 Comprehensive Performance Evaluations.	221 sanitary surveys were completed, including 4 Comprehensive Performance Evaluations.	125 sanitary surveys were completed, including 5 Comprehensive Performance Evaluations.
# of UIC inspections, wells returned to compliance, and outreach events (1999 text)	429 inspections; 66 enforcement actions; 102 UIC wells returned to compliance; 16 outreach events.	193 inspections; 54 Enforcement actions; 67 UIC wells returned to compliance: -41 Non-voluntary (after enforcement); -26 Voluntary (without enforcement). 18 Outreach events.	106 inspections; 32 Enforcement actions; 62 UIC wells returned to compliance: -31 Non-voluntary (after enforcement); -31 Voluntary (without enforcement). 8 Outreach events.

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Outputs	FFY 2001	FFY 2002	FFY 2003
# of on-site laboratory audits/inspections	18 inspections total (17 chemistry on-site inspections and 1 microbiology inspection) were conducted for laboratories performing analysis of drinking water.)	31 inspections total (18 chemistry on-site inspections and 13 microbiology inspections) were conducted for laboratories performing analysis of drinking water.	36 inspections total (20 chemistry on-site inspections and 16 microbiology inspections) were conducted for laboratories performing analysis of drinking water.
# of laboratories certified for microbiological and chemical analyses under the SDWA certification program	**In-state Laboratories** 91 laboratories are located in Massachusetts: 36 are certified to analyze one or more chemical contaminants in potable waters; 77 are certified to analyze for microbiological contaminants **Out–of-state Laboratories** There are 65 laboratories located outside Massachusetts: 63 are certified to analyze one or more chemical contaminants in potable waters; 10 are certified to analyze for microbiological contaminants.	**In-state Laboratories** 99 laboratories are located in Massachusetts: 32 are certified to analyze one or more chemical contaminants in potable water; 73 are certified to analyze for microbiological contaminants. **Out-of-state Laboratories** There are 75 laboratories located outside Massachusetts: 60 are certified to analyze one or more chemical contaminants in potable waters; 10 are certified to analyze for microbiological contaminants. Beginning July 2003, a schedule of 2 microbiology laboratory inspections per month should be possible, provided that funding is secured for the NEIWPCC employee to travel to Cincinnati for the EPA course and also to the laboratories to be inspected. This schedule will result in the inspection of approximately one- third of the microbiology laboratories each year. These plans depend on having the current level of resources available for the rest of state FY2003 and FY2004. *	**In-state Laboratories** 97 laboratories are located in Massachusetts: 33 are certified to analyze one or more chemical contaminants in potable waters; 72 are certified to analyze for microbiological contaminants. **Out-of-state Laboratories** There are 69 laboratories located outside Massachusetts: 54 are certified to analyze one or more chemical contaminants in potable water; 10 are certified to analyze for microbiological contaminants. At the end of December 2002, the principal microbiology laboratory certification officer position was filled as a NEIWPCC contractor, supported with federal set-aside funds provided by the U.S. EPA directly to the NEIWPCC. In June 2003, the microbiology laboratory certification officer successfully completed the U.S. EPA Microbiology Laboratory Certification Officer Training Course held at the U.S. EPA National Exposure Research Laboratory in Cincinnati, Ohio, and was certified by the U.S. EPA as a member of the regional certification team for microbiology. In July 2003, with the addition of this new certification officer, sufficient resources became available to implement a schedule of 3 microbiology laboratory inspections on average per month (i.e., an aggressive three-year inspection cycle).
# of capacity development reviews	**Community and Non-transient non-community systems:** 128 systems (18%). **Transient non-community systems:** 155 systems (18%).	**Community and Non-transient non-community systems:** 159 systems (22%). **Transient non-community systems:** 140 systems (16%).	**Community and Non-transient non-community systems:** 140 systems (19 %). **Transient non-community systems:** 46 systems (5%).
# of operators certified or recertified	2,469	3,011 * Regarding EPA's comments on the 2001 PPA about	3,968

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Outputs	FFY 2001	FFY 2002	FFY 2003
		numbers of certified or re-certified operators, the DEP can only speculate as to why the number of certified operators decreased. There can be a number of reasons such as computer error, operators failed to renew during renewal cycle, operators retiring, operators with OIT licenses not renewing, etc. DWP feels that the number is of minor significance since in Massachusetts 97.5% of the PWSs have operators and we are actively pursuing compliance with the remaining systems.	
# of water quality monitoring reports reviewed	Ongoing. DEP does not perform the actual testing; however DEP reviews all reports that are submitted. Approximately 30,000 sample reports were reviewed during each fiscal year.		
# of monitoring waivers reviewed and granted	4 VOC waivers, 56 SOC waivers, and 11 IOC waivers were reviewed and approved.	5 VOC waivers, 27 SOC waivers, and 2 IOC waivers were reviewed and approved.	187 VOC waiver applications reviewed and 115 granted. 235 IOC waiver applications reviewed and 145 granted. 238 SOC waiver applications reviewed and 120 granted.
Regulatory changes	On June 5, 2001 DEP issued final regulations for Capacity Development, Consumer Confidence Reporting, Certified Operator requirements, Cross connections, Secondary Maximum Contaminant Levels, PWS definition, Variances and Exemptions and many other miscellaneous requirements. DEP also issued draft regulations for Interim Enhanced Surface Water Treatment Rule (IESTWR), Disinfection Byproduct Rule (DBPR), Modifications to the Lead and Copper Rule, Public Notification and Unregulated Contaminant Monitoring Rule (UCMR).	On 11/09/01, DEP issued final regulations for the Interim Enhanced Surface Water Treatment Rule (IESTWR), Disinfection Byproduct Rule (DBPR), Modifications to the Lead and Copper Rule, Public Notification and Unregulated Contaminant Monitoring Rule (UCMR). In FY 2002, DEP also issued draft regulations for the Filter Backwash Recycle Rule (FBRR), the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), Radionuclides Rule and for modifications to the existing Arsenic Rule, including a new Maximum Contaminant Level.	On 12/6/02, DEP issued final regulations for the Filter Backwash Recycle Rule (FBRR), the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), Radionuclides Rule, and for modifications to the existing Arsenic Rule, including a new Maximum Contaminant Level.
Increased level of enforcement	DEP continued to implement its enforcement strategy. DEP used many tools to enhance enforcement, including one-page electronically updated notices of non-compliance and pre-determined penalty assessment notices.	DEP extended its Comprehensive Compliance Strategy to include Ground Water Under the Influence for transient non-community systems. DEP continues to work to improve Boston-regional coordination. DEP continued to implement its enforcement strategy. DEP	DEP continued to implement its enforcement strategy. DEP used several innovative tools to enhance enforcement, including working in partnership with the Massachusetts Board of Certification of Drinking Water Operators to initiate pre-enforcement action against 30 certified operators that provided

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Outputs	FFY 2001	FFY 2002	FFY 2003
		used many tools to enhance enforcement, including one-page electronically updated notices of non-compliance and pre-determined penalty assessment notices. DEP continues to work to improve Boston-regional coordination.	oversight to public water systems with 5 or more violations. DEP also worked in partnership with the Massachusetts Department of Public Health and local boards of health to initiate suspension or revocation of local permits whenever there was overlapping jurisdiction with recalcitrant public water systems. DEP continued to use one-page electronic notices of non-compliance and pre-determined penalty assessment notices. DEP continues to work to improve Boston-regional coordination.
Technical assistance to public water suppliers	40+ Source Protection related outreach events targeted public water suppliers alone or in combination with local officials. In addition, 332 public water systems had technical assistance encounters as a result of SRF set-asides funding. Technical assistance was also targeted to specific groups including water districts, boards of health, mobile home parks and campgrounds.	10 Source Protection related outreach events targeted to public water suppliers alone or in combination with local officials. In addition, 458 public water systems had 674 technical assistance encounters as a result of SRF set-asides funding. Technical assistance was also targeted to specific groups including boards of health, mobile home parks and campgrounds.	433 technical assistance visits to public water systems as part of the SWAP Program outreach. 9 Vegetation Management Panel (VMP) technical assistance meetings. Wellhead protection assistance resulted in 112 sources being protected. 50 technical electronic training encounters on distribution protection were completed. In addition, 369 public water systems had 494 technical assistance encounters as a result of SRF set-asides funding. Technical assistance was also targeted to specific groups including non-governmental agencies (NGOs) and certified operators, schools, boards of health, mobile home parks, and campgrounds.
# of loans to assist in achieving compliance with SDWA requirements	22 loans.	26 loans.	16 loans.
# of source protection plans reviewed and approved	21 source protection plans reviewed and approved.	8 source protection plans reviewed and approved.	34 source protection plans reviewed and approved (4 ground water; 30 surface water).
# of source water assessments	385 final assessment reports.	467 final assessment reports.	215 final assessment reports.
# of Water Management Act (WMA) permits for sources pumping more than 100,000 gallons per day	21 WMA permits, 4 WMA permit amendments were issued.	11 WMA permits, and 7 WMA permit amendments were issued.	17 WMA permits and 8 WMA permit amendments were issued.

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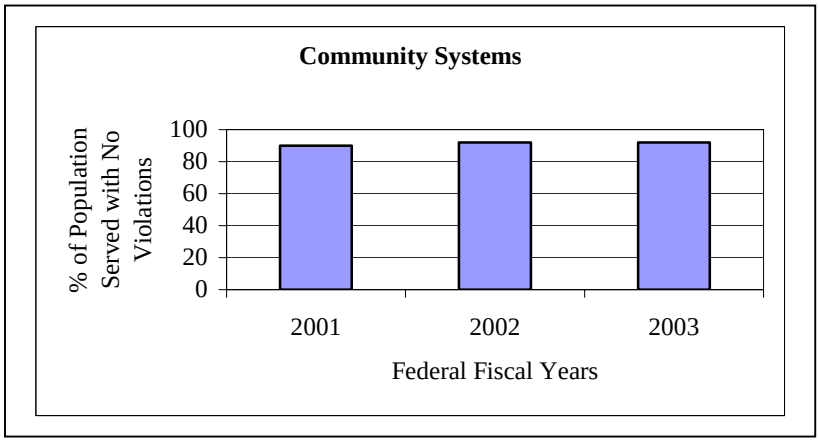
Trend Analysis

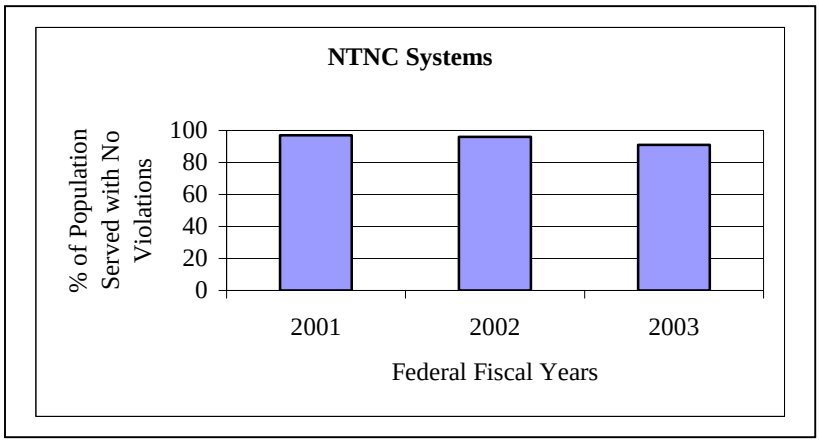
From 1999 to 2003 several trends emerge in DEP's work to advance the goal of ensuring that every public water supply consistently provides water that is safe to drink

- Maintained strong compliance with health-based standards in Public Water Supplies, protecting health of users. The drop in compliance among NTNC systems is attributable to Monthly MCL violations of the TCR. This result will be monitored to determine if it becomes a trend that requires additional oversight. (See Graph 1, following.)
- Reduced risks of health impacts from distribution systems by assuring that towns have approved distribution systems. (See Graph 2, following.)
- Reduced risks of health impacts from improper operation of treatment plants by maintaining the percentage of systems with certified operators above 95% despite several transient non-community systems changing ownership and certified operators. (See Graph 2, following.)

Graph 1:

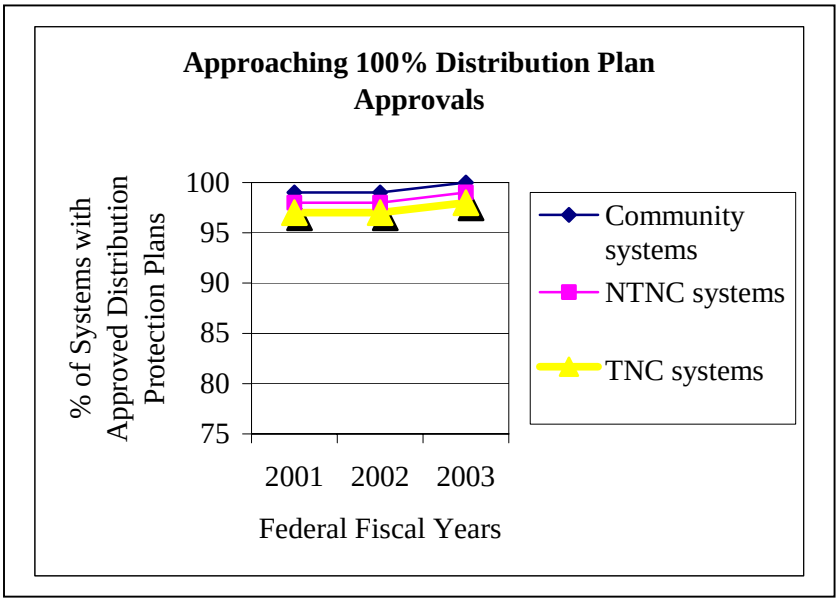
Maintaining Strong Compliance with Health-based Standards

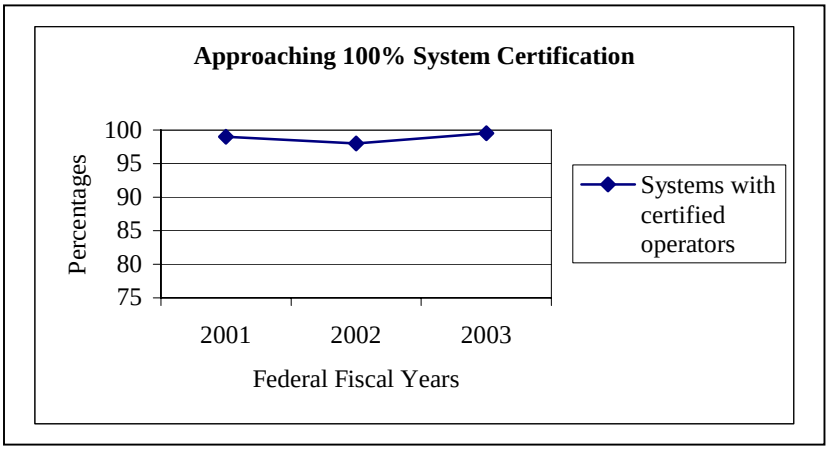




Graph 2:

Reducing the Risk of Exposure to Unhealthy Drinking Water





Note: Although the percentage of systems certified as of 2002 dropped slightly, the number of systems certified has increased. See Outcomes table.

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List of References of work products submitted or available

Other work products

DEP published the following documents:

- **Source Protection:** 3 source protection articles published in "In the Main" newsletter.
- **Distribution System Protection-Cross Connection:** 4 "In The Main" training articles.
- **Water Management Act Technical Assistance:** 1 "In The Main" technical assistance article.
- **Capacity Technical Assistance:** 2 "In The Main" articles.
- **Regulatory news**: 4 issues of "In The Main."

Clean Water Operational Goal #2: Reduce, eliminate, and/or control both point and non-point discharges to surface and groundwater

What needs to be done

- Implement watershed-based assessment, permitting, compliance, enforcement, public outreach, and non-point source control.
- Control inland and coastal non-point sources of pollution.
- Improve wastewater treatment and management.

2003 Highlights in meeting goal

In 2003, DEP had several successes in advancing this goal. These included:

- Developed a quality assurance project plan and conducted bio-monitoring, fish population monitoring, and water quality monitoring in the Blackstone, Chicopee, Connecticut, and Nashua River basins in 2003. Bio-monitoring and fish population monitoring were conducted at 44 sites; water quality monitoring was conducted at 126 sites. In addition, DWM coordinated additional sampling efforts with the Department of Fish and Wildlife (DFW). DFW conducted fish population studies at 70 sites within these watersheds. Water quality data were collected at each site 6 times during the summer.
- Conducted TMDL monitoring in Quaboag Pond and Quacumquasit Pond in 2003. DWM also collected water quality data to support nutrient criteria development at 108 river stations (under a contract with USGS) and in 40 lakes throughout the Commonwealth.
- Developed a draft strategy for statewide nutrient criteria for EPA review and comment.
- Developed draft and final "Integrated List of Waters" for EPA review and approval. Submitted electronic geo-referencing to EPA's consultant and are finalizing the remaining elements of the electronic update.
- Developed 3 draft water quality assessment reports (WQAR), published 3 final WQARs, and started development of 4 new assessment reports.
- Developed 14 new Section 319 projects totaling $3,122,665 in order to abate and control non-point sources of pollution.
- Developed and submitted 28 TMDLs during FFY2003 and continued TMDL work on the Assabet River, Nashua River, Palmer River, Shawsheen River, Kickemuit River, and several estuaries as part of the Massachusetts Estuaries Project (MEP).
- Continued conversion and integration of DEP's databases to EPA's Assessment Database System (ADB).
- Significant progress was made on revisions to the State Water Quality Standards.
- Work has commenced on developing a statewide monitoring strategy in accordance with EPA's ten key elements.

In 2003, DEP had several successes in advancing this goal through the Massachusetts Estuaries project. These included:

- Publication of *The Massachusetts Estuaries Project, Embayment Restoration and Guidance for Implementation Strategies*, a handbook for local officials that provides guidance on technical and institutional approaches to reducing nitrogen levels in estuaries.

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2003 Highlights in meeting goal

- Publication of *The Massachusetts Estuaries Project, Site Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report* presenting interim nitrogen threshold values and coastal water classifications.
- In partnership with the University of Massachusetts, School of Marine Science and Technology, significant progress has been made in nitrogen modeling within the Massachusetts Estuaries Project study area. The first five technical reports for five estuaries in Chatham were completed in draft form. Almost all of the 89 estuaries within the MEP study area have ongoing nutrient-related monitoring. All necessary hydrodynamic, nutrient, nutrient flux, hydraulic and benthic information have been gathered for the first 33 estuaries in the study area.
- Continued implementation of Groundwater Discharge Comprehensive Compliance Strategy resulting in maintenance of increased compliance rate as shown in Graph 3, below.

DEP conducted these training or outreach sessions:

- DEP developed and coordinated the 14th Annual New England Nonpoint Source Conference in May 2003.
- DEP developed and coordinated the annual conference of the New England Association of Aquatic Biologists (NEAEB) in March 2003.
- Twelve outreach events concerning the NPDES Stormwater Phase II program requirements and general stormwater management practices. In October 2002, DEP and EPA staff held three statewide public meetings and one public hearing to discuss the requirements of the draft EPA NPDES General Permit for Stormwater Discharges from MS4s. Phase II technical assistance training workshops were held by DEP for Massachusetts MS4 communities, targeted municipal DPW and highway staff, building inspectors, planning board and conservation commission members. DEP also partnered with EPA at several workshops for Massachusetts construction industry association members to discuss stormwater management at construction sites.
- Sixty-one training courses on various topics were offered for WWTP operators.
- Department staff conducted four regional seminars for Massachusetts Health Officer's Association (MHOA) members and discussed implementation of Title 5 governing on-site systems. Department staff presented six workshops at the annual MHOA conference about environmental indicators, innovative/alternative on-site system technology, new Title 5 policies, underground injection control, and implementation of Title 5.

Environmental Indicators	FFY 2000-2001	FFY 2002	FFY 2003
of assessed water bodies that protect public health and the environment by supporting fish and shellfish consumption, safe recreation, and healthy aquatic life use designations (indicator for 1998 and 1999) **# and % of assessed river miles, lake acres, and estuary square miles that have water quality supporting beneficial uses, including, where applicable, for: a) fish and shellfish consumption; b) recreation; c) aquatic life support; d) drinking water supply (The reporting period is two years)‡ (indicator for 2000)** (DEP reports on support of aquatic life, fish consumption, swimming, and secondary contact such as boating every two years. These items are called "uses." The same waters are not assessed each year, nor are all waters assessed each year; as such, the data should not be used to identify trends.)	For assessed: **river miles,** 42% fully support their uses, 16% partially support, and 43% do not support any use. [Based on 32% of state mileage assessed. Overall -- 13% fully support, 5% partially support, 14% do not support, and 68% not assessed.] **lake acres,** 28% fully support their uses, 22% partially support, and 50% do not support any use. [Based on 72% of state acreage assessed. Overall – 20% fully support, 16% partially support, 36% do not support, and 28% not assessed.] **marine waters,** 37% fully support their uses, 13% partially support, and 50% do not support any use. [Based on only 10% of state area assessed. Overall – 4% fully support, 1% partially support, 5% do not support, and 90% not assessed.] [2001 data are based on estimates compiled for the Environmental Goals Project.]	***Below data is based on Preliminary DRAFT 2002 Integrated list data and therefore may change based on final list*** **Assessed river miles,** 40% fully support their uses, 16% partially support, and 44% do not support any use. [Based on 32% of state mileage assessed. Overall -- 27% fully support, 10% partially support, 30% do not support, and 33% not assessed.] **Assessed lake acres,** 27% fully support their uses, 20% partially support, and 52% do not support any use. [Based on 80% of state acreage assessed. Overall – 25% fully support, 19% partially support, 49% do not support, and 7% not assessed.] **Assessed marine waters,** 33% fully support their uses, 11% partially support, and 55% do not support any use. [Based on only 8% of state area assessed. Overall – 33% fully support, 11% partially support, 55% do not support, and 1% not assessed.] b) **River Miles:** total assessed = 1,784. Zero miles (0%) support fish consumption (statewide advisory); 512 miles (29%) support primary contact; 670 miles (38%) support secondary contact; 798 miles (45%) support aquatic life.	***Below data is based on FINAL approved 2002 Integrated List*** **Assessed River miles:** 40% fully support their uses; 16% partially support; and 44% do not support any use. Overall: 9% fully support; 3.5% partially support; 10% do not support; 78% not assessed. **River Miles**: total assessed = 1,791. Zero miles (0%) support fish consumption (statewide advisory); 488 miles (27%) support primary contact; 670 miles (37%) support secondary contact; 798 miles (45%) support aquatic life. **Assessed Lake Acres:** 26% fully support their uses; 20% partially support; and 54% do not support any use. Overall: 20% fully support; 15% partially support; 40% do not support; 25% not assessed. **Lake Acres**: total assessed = 112,598 acres. Zero acres (0%) support fish consumption (statewide advisory); 2,216 acres (2%) support primary contact; 80,525 acres (71%) support secondary contact; 2,840 acres (3%) support aquatic life.

‡ Environmental Indicators marked with this symbol are Core Performance Measures.

FFY = Federal Fiscal Year. When data isn't compiled by federal fiscal year, the closest possible complete year is used.

‡ Outcomes marked with this symbol are Core Performance Measures.

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
% of assessed…[concluded] **# and % of assessed river miles, lake acres, and estuary square miles that have water quality supporting beneficial uses, including, where applicable, for: a) fish and shellfish consumption; b) recreation; c) aquatic life support; d) drinking water supply (The reporting period is two years)‡** **(indicator for 2000)** (DEP reports on support of aquatic life, fish consumption, swimming, and secondary contact such as boating every two years. These items are called "uses." The same waters are not assessed each year, nor are all waters assessed each year; as such, the data should not be used to identify trends.)		***Below data is based on Preliminary DRAFT 2002 Integrated list data and therefore may change based on final list*** **Lake Acres**: total assessed = 112,618 acres. Zero acres (0%) support fish consumption (statewide advisory); 2,216 acres (2%) support primary contact; 80,525 acres (72%) support secondary contact; 2,840 acres (3%) support aquatic life. **Marine Sq. Miles:** total assessed = 221. Zero sq. mi. (0%) support fish consumption (statewide advisory); 132 sq. mi. (60%) support primary contact; 145 sq. mi. (65%) support secondary contact; 68 sq. mi. (31%) support aquatic life; 76 sq. mi. (35%) support shell fishing.	***Below data is based on FINAL approved 2002 Integrated List*** **Assessed Marine Waters:** 31% fully support their uses; 10% partially support; and 59% do not support any use. Overall: 2.5% fully support; 0.9% partially support; 5% do not support; 91.5% not assessed. **Marine Sq. Miles:** total assessed = 227 Zero sq. mi. (0%) support fish consumption (statewide advisory); 132 sq. mi. (58%) support primary contact; 145 sq. mi. (64%) support secondary contact; 68 sq. mi. (30%) support aquatic life; 77 sq. mi. (34%) support shell fishing.
# of assessed acres open, conditionally open, restricted, and closed to shell fishing (MA Division of Marine Fisheries data)	1,442,337 acres approved; 30, 155 acres combined restricted and conditionally open; 142,127 acres prohibited. (1 July 2000)	Data not yet available from the Division of Marine Fisheries.	1,442,874 acres approved; 31,721 acres combined restricted and conditionally open; 142,298 acres prohibited. (Jan. 21, 2003)

‡ Environmental Indicators marked with this symbol are Core Performance Measures.

FFY = Federal Fiscal Year. When data isn't compiled by federal fiscal year, the closest possible complete year is used.

‡ Outcomes marked with this symbol are Core Performance Measures.

Outcomes	FFY 2001	FFY 2002	FFY 2003
# and % of impaired, assessed river miles, lake acres, and estuary square miles that **a) are covered under Watershed Restoration Action Strategies, and** **b) were restored to their designated uses during the reporting period. (The reporting period is two years.)** ‡	a) DEP submitted action plans for the following watersheds: Blackstone, Chicopee, Connecticut, and Nashua. The action plans identify proposed actions to be taken to abate both point and non-point source water quality problems; however, we do not know how many miles of impaired segments would be covered. (The action plans are related mostly to the entire watershed). b) Zero. None have been documented.	a) DEP submitted action plans for the following watersheds: Boston Harbor, Cape Cod, French & Quinebaug, Merrimack, Narragansett / Mt. Hope Bay, and Parker. The action plans identify proposed actions to be taken to abate both point and non-point source water quality problems; however, we do not know how many miles of impaired segments would be covered. (The action plans are related mostly to the entire watershed.) A better measure DEP can provide is the # of miles or acres of water bodies that were covered under TMDL plans. For FFY02 those statistics are as follows: • Rivers (Bacteria) = 106 miles; • Estuaries (Bacteria) = 1.3 square miles; • Lakes (Nutrients) = 4,029 acres. b) None have been documented.	a) Individual Watershed Action Plans were not developed by DEP commencing in 2003 as DEP was switching to the new Environmental Goals Project. DEP did, however, develop non-point source action strategies for all 27 watersheds, which were provided to EPA and have been posted on the DEP web site. These strategies have been used as a tool by DEP and outside groups to identify and prioritize federal, state, and local actions for follow-up implementation. They have also been used to prioritize projects under Section 319 and NCRS' EQIP program and to track non-point source issues and actions on a segment-by-segment basis in each watershed. DEP is also evaluating other alternatives to incorporate these goals into existing documents such as our water quality assessment reports. In addition, DEP believes that a better measure is to provide the number of miles or acres of waterbodies covered under TMDL plans; for FFY03 28 lake TMDLs were developed to protect an additional 1,877 acres. b) None have been documented to date.
% of POTWs that are beneficially reusing all or a part of their biosolids and, where data exists, the % of biosolids generated that are beneficially reused‡	Approximately 18% of the 134 MA POTWs beneficially reuse some or all of their sludge. Approximately 20% of the 274,571 dry tons of sludge were beneficially reused as biosolids.	Approximately 16% of the 134 MA POTWs beneficially reuse some or all of their sludge. Approximately 18% of the 274,571 dry tons of sludge were beneficially reused as biosolids.	Approximately 15% of the 134 Massachusetts POTWs beneficially reuse some or all of their sludge. Approximately 18% of the 274,571 dry tons of sludge were beneficially reused as biosolids.
% of NPDES discharge permittees in compliance with permit effluent limits	Information in PCS (Permit Compliance Status) federal database.	Information in PCS (Permit Compliance Status) federal database.	Information in PCS (Permit Compliance Status) federal database.
# of assessed river segments, lakes, and ponds with water quality impairments	Updates only compiled every two years for 303(d) and 305(b) purposes. Next list will be developed in 2002.	Based upon the proposed 2002 Integrated list (not yet approved): • Rivers: 292 segments; • Lakes: 560 segments; • Marine: 150 segments.	Based upon the FINAL 2002 Integrated list: • Rivers: 294 segments; • Lakes: 578 segments; • Marine: 196 segments.

Outputs	FFY 2001	FFY 2002	FFY 2003
a) % of river miles and lake acres that have been assessed for the need for fish consumption advisories;	a) In 2001 DWM collected fish samples from ten lakes representing approximately 4,000 acres to evaluate the risk associated with fish consumption by humans.	a) In 2002 DWM collected fish samples from twelve lakes representing 1,415 acres and two rivers representing approximately 13 river miles for the need for fish consumption advisories.	a) In 2003 DWM collected fish samples from one lake representing 10 acres. DEP/ORS collected from an additional 11 lakes representing 2,287 acres. Total: 2,297 acres
b) compilation of state-issued fish consumption advisory methodologies, as reported through the National Listing of Fish and Wildlife Advisories‡	b). No new updates done by the Department of Public Health during 2001.	b) See *Freshwater Fish Consumption Advisory List*, June 2002. This represents the most recent update.	b) See *Freshwater Fish Consumption Advisory List*, June 2002. This represents the most recent update.

Outputs	FFY 2001	FFY 2002	FFY 2003
The TMDL status for each state, including: a) the number of TMDLs identified on the 1998 303(d) list that the state and EPA have committed to produce in the two year cycle; b) the number of TMDLs submitted by the state to EPA; c) the number of state-established TMDLs approved by EPA; and d) the number of EPA-established TMDLs. (This cumulative measure would be jointly reported by EPA and the state.) ‡	a) 81 for FFY01&02 b) 16 c) 0 d) 0	a) 81 for FFY01&02 b) 77 c) 93 d) 20 in a joint effort	a) 40 b) 28 c) 28 d) 0
DEP water quality assessment reports	➢ Final Assessments for the Blackstone, Chicopee, Connecticut, Nashua, and Parker. ➢ Draft Assessments for the Merrimack and Narragansett Bay/ Mt. Hope Bay.	➢ Final Watershed Assessments for the Merrimack, Narragansett/Mt. Hope Bay, French & Quinebaug, and Cape Cod watersheds. ➢ Draft assessment for the Boston Harbor Watershed.	➢ Final Watershed Assessment published for Cape Cod, Boston Harbor, and Shawsheen basins. ➢ Draft assessment reports completed for Shawsheen, Buzzards Bay, and Islands. ➢ Additional reports under development: Millers River, Deerfield, Ipswich, and Farmington.

‡ Outputs marked with this symbol are Core Performance Measures.

DEP Watershed Action Plans	➢ Completed Blackstone, Chicopee, Connecticut, and Nashua. ➢ Started the Boston Harbor, Cape Cod, French & Quinebaug, Merrimack, Narragansett/Mt. Hope Bay, and Parker.	➢ Completed 2001 Watershed Status Report and Actions Taken for the Boston Harbor, Cape Cod, French & Quinebaug, Merrimack, Narragansett/Mt. Hope Bay and Parker River Watersheds. Watershed Action Plans will not developed by DEP commencing in 2003 as DEP was switching to the new Environmental Goals Project.	c) Individual Watershed Action Plans were not developed by DEP commencing in 2003 as DEP was switching to the new Environmental Goals Project. DEP did, however, develop non-point source action strategies for all 27 watersheds, which were provided to EPA and have been posted on the DEP web site. These strategies have been used as a tool by DEP and outside groups to identify and prioritize federal, state, and local actions for follow-up implementation. They have also been used to prioritize projects under Section 319 and NCRS' EQIP program and to track non-point source issues and actions on a segment-by-segment basis in each watershed. DEP is also evaluating other alternatives to incorporate these goals into existing documents such as our water quality assessment reports. In addition, DEP believes that a better measure is to provide the number of miles or acres of waterbodies covered under TMDL plans; for FFY03 28 lake TMDLs were developed to protect an additional 1,877 acres.
305(b) electronic update	➢ No report was required in this year.	➢ Electronic Update of new integrated list was submitted. New list takes place of 305(b) report.	➢ Geo-reference updates submitted. Final electronic files updates being compiled.
303(d) update	➢ No list was submitted nor was it required because of pending changes in the TMDL rule.	➢ New Integrated list developed and submitted to EPA for review on October 1, 2002.	➢ Final 2002 Integrated list approved 10/1/03.

Outputs	FFY 2001	FFY 2002	FFY 2003
TMDLs	DEP received comments back from EPA on the draft TMDLs for the Northern Blackstone Lakes, Chicopee Lakes, Connecticut Lakes, and several others (see list under FFY 2000). Much of the year was spent preparing these for final submission to EPA. The final version of the Northern Blackstone Lakes TMDL (see list of lakes under FFY 2000) was submitted to EPA in Sept. 2001. Work was also begun on selected French River lakes for a composite TP TMDL. The lakes involved are: Buffumville Lake, Cedar Meadow Pond, Dresser Hill Pond, Dutton Pond, Gore Pond, Granite Reservoir, Greenville Pond, Hudson Pond, Jones Pond, Larner Pond, Lowes Pond, McKinstry Pond, New Pond, Peter Pond, Pierpoint Meadow Pond, Pikes Pond, Robinson Pond, Rochdale Pond, Shepherd Pond, Texas Pond, Mosquito (Tobins) Pond, and Wallis Pond.	**The following TMDLs were revised and re-submitted to EPA during FFY02**: *Connecticut Lakes:* Aldrich Lake East, Aldrich Lake West, Leverett Pond, Lake Warner, Loon Pond, Lake Wyola *Chicopee Lakes:* Browning Pond, Minechoag Pond, Spectacle Pond, Wickaboag Pond, Long Pond, Mona Lake, Sugden Reservoir *Neponset River Bacteria (20 segments)* *Shawsheen River Bacteria: (16 Segments* *Others:* Little Harbor Cohasset, Blackstone River, Lake Boon, Indian Lake, Lake Quinsigamond, Flint Pond, Salisbury Pond, Leesville Pond. The following TMDLs were also submitted during FFY02 *French River Watershed lakes:* Buffumville Lake, Cedar Meadow Pond, Dresser Hill Pond, Dutton Pond, Gore Pond, Granite Reservoir, Greenville Pond, Hudson Pond, Jones Pond, Larner Pond, Lowes Pond, McKinstry Pond, New Pond, Peter Pond, Pierpoint Meadow Pond, Pikes Pond, Robinson Pond, Rochdale Pond, Shepherd Pond, Texas Pond, Mosquito (Tobins) Pond, and Wallis Pond. Total submitted FFY02=77 Total Approved FFY02 = 93	**The following TMDLs were finalized and approved by EPA in FFY03**: Millers Lakes: Beaver Flowage Pd., Bents Pond, Bourn-Hadley Pd., Brazell Pd., Cowee Pd., Davenport Pd., Lake Denison, Depot Pd., Lake Ellis, Greenwood Pd. (Westminister), Greenwood Pd. (Templeton), Hilchey Pd., Lower Naukeag Lake, Minott Pd. (south), Minott Pd., Lake Monomonac, Parker Pd., Ramsdall Pd., Reservoir #1 (Athol), Reservoir #2 (Phillipston/Athol), Riceville Pd., South Athol Pd., Stoddard Pd., Wallace Pd., Ward Pond, Whites Mill Pd., Whitney Pd., Wrights Reservoir. Work also continued on the following TMDLs: Assabet River (nutrients/low D.O., Nashua River (nutrients), Chatham embayments nutrients (5), Frost Fish Creek (bacteria), Muddy Creek (bacteria), Palmer River (bacteria), Pomponessett Bay (nutrients), Waquoit Bay (nutrients) Quaboag Pd. (nutrients), Shawsheen Headwaters (stormwater), Kickemuit (bacteria), Oyster Harbor (bacteria), W. Falmouth Harbor (bacteria), Nantucket Harbor (bacteria), Sesachacha Pd. (bacteria). As of the end of this reporting period TMDLs have been completed for approximately 10% (6,059 acres) of lakes; 9.2% (127 miles) of rivers; and 0.6% (1.26 sq.mi.) of marine waters listed in category 5 of our 2002 integrated list. Additional work is underway for another 1.7% (1,051 acres) of the lakes; 4.9% (67.7 miles) of river; and 5.5% (11.54 sq. mi.) of marine waters. Total Submitted FFY03 = 28 Total Approved FFY03 = 28

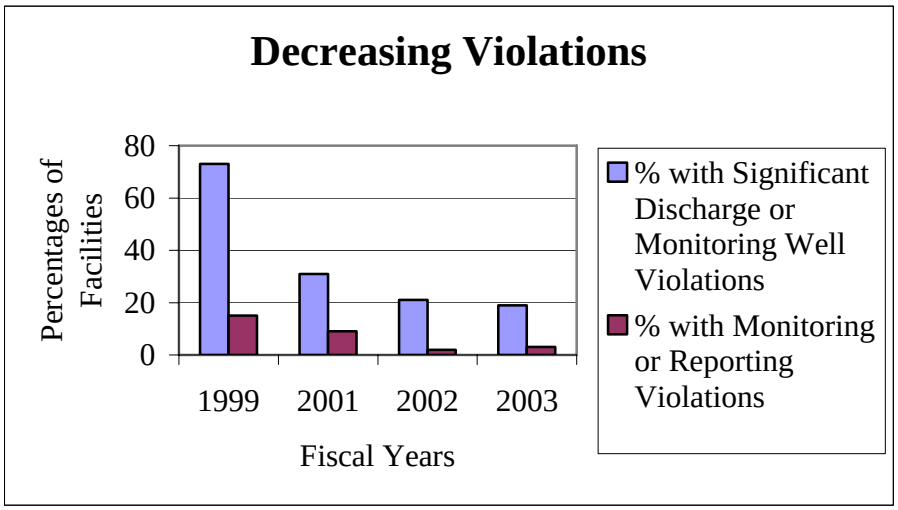
Note: All outputs are based on calendar year, except for 303(d) update and 305(b) electronic update, which are done every two federal fiscal years.

Trend Analysis

From 1999 to 2003 several trends emerge in DEP's work to advance the goal of reducing, eliminating, and/or controlling both point and non-point discharges to surface and groundwater.

- We reduced pollution to groundwater by improving compliance with groundwater discharge permits (See Graph 3, following.)
- In regard to attaining levels of surface water quality that support intended uses, however, we are generally not increasing the percentages of waters assessed due to decreasing budgets. (See Graph 4, following.)

Graph 3:



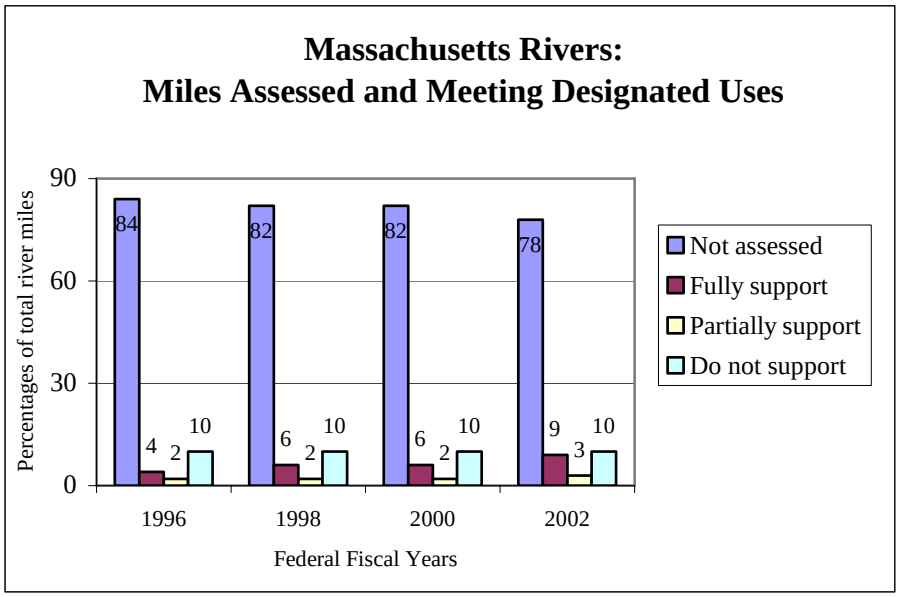
Graph 4:
(Data sources: 305(b) reports for 1996, 1998, and 2000; Program Director for 2002.)

Note:

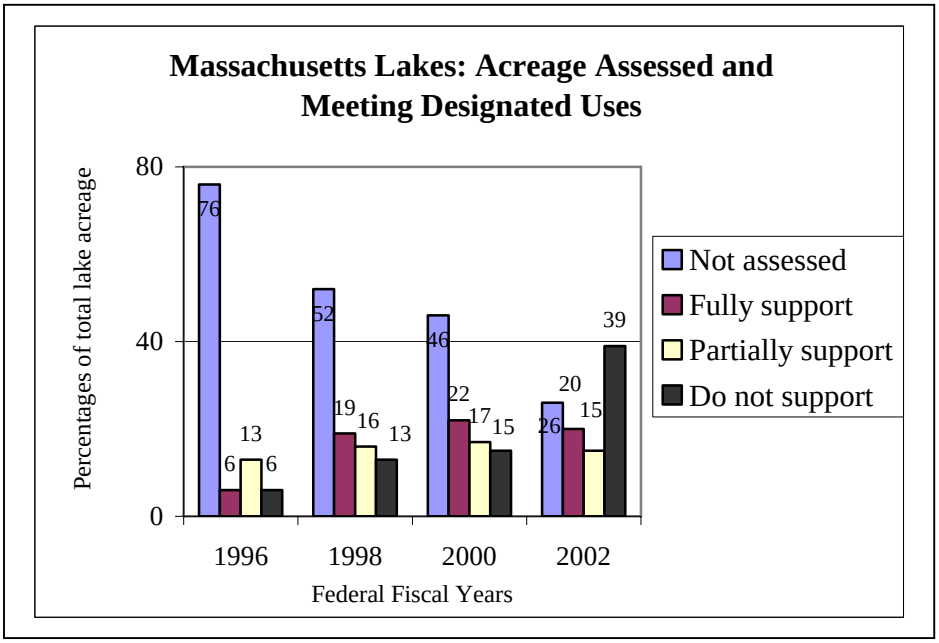
Although graphs of surface water quality data are presented here, their value for assessing trends must be discounted for two reasons:

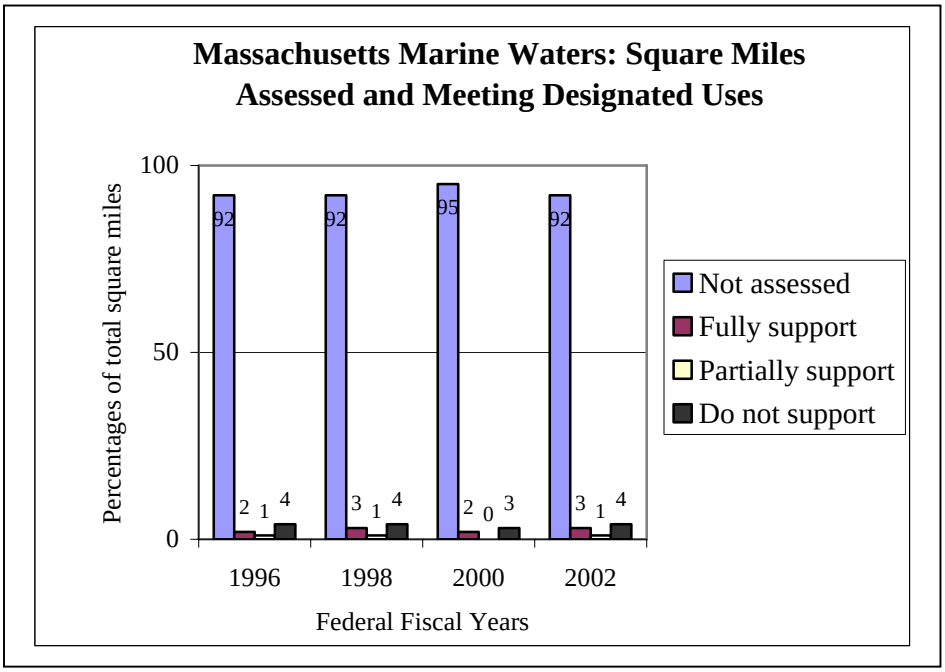
- *The graphed data, taken from biennial 305(b) reports, is summary data, representing diverse data collection activities that are scheduled according to the 5-Year Basin Management cycle. We collect data in different basins for different reasons, and we collect data in different places within a basin. We might collect data at the same place once every five years when the management cycle repeats, but if we do so, it would be by coincidence, not design. So to induce general trends from data representing such differing circumstances could be misleading.*
- *We have typically deployed our limited field staff in areas where water quality problems are known to exist so that we can develop models and analyze alternatives for pollution abatement. Consequently, our statistics describing waters not supporting their uses are skewed by this approach because, by contrast, if we were to sample routinely at "cleaner" locations, the results would likely change significantly. Hence, it could be misleading, again, to infer general conclusions about all the waters of the commonwealth on the basis of this non-representative, targeted data.*
- *The Environmental & Performance Measures section of this report includes 2003 data. This data is compiled and reported separately to EPA every two years. As such, the compiled data will be available for inclusion in this report after the 2004 update.*

(We do recognize the need to better define trends in water quality, and consequently we're considering use of alternative strategies. Also, we have begun developing a long-term monitoring strategy in accordance with EPA guidelines)



Graph 4 (concluded):





List of References of work products submitted or available

Other Work Products

DEP also published the following documents:

- 2003 Quality Assurance Project Plan (QAPP).
- Draft and final "Integrated list of Waters."
- Final water quality assessment reports (WQAR) for Cape Cod, Boston Harbor, and Shawsheen River watersheds.
- Draft water quality assessment reports for Shawsheen River, Buzzards Bay, and Islands watersheds.
- Draft and Final "Total Maximum Daily Loads of Phosphorus for Selected Millers Basin Lakes."
- Draft Stormwater Pollutant Total Maximum Daily Load for Headwaters of the Shawsheen River.
- Draft MEP Thresholds Document.

Clean Water Operational Goal #3: No Net Loss of Wetlands

What needs to be done

- Prevent loss of wetlands and replicate wetlands where appropriate.
- Protect "riverfront areas."
- Analyze the impact of buffer zones.
- Implement stormwater "best management practices" (BMPs) to minimize degradation from runoff.
- Identify and address un-permitted fillings and/or alterations of wetlands.

2003 Highlights in meeting goal

During 2003 DEP made important progress in its Wetlands Change Project. The following actions were taken and accomplishments achieved.

- In 2003 MA DEP progressed to eighty-five percent (85%) toward identifying state wetlands in 2003.
- 760 acres of wetlands loss (without accounting for replication) were identified.
- Work efforts determined that at least 50% of the wetlands loss occurring in the past decade was un-permitted loss.
- Significant enforcement cases identified by the Wetlands Change Project were undertaken resulting in assessed penalties of $280,000. Other enforcement cases are currently under investigation or are being executed.
- Planning advanced on analyzing data, providing Wetlands Change maps and information to municipalities, and on developing compliance strategies.
- DEP is close to issuing regulation changes to streamline permitting, often working with the Wetlands Advisory Subcommittee. These proposed changes were presented at two MACC Fall Conferences, the Massachusetts Society of Municipal Conservation Professionals, and the SuAsCo, Charles, and North Shore Conservation Commission networks.
- Local, state and national media outlets covered the developments in the Wetlands Change Project.

Environmental Indicators and other Performance Measures

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
Acres of wetlands in Massachusetts maintained over time	Of the 71% of the state that has been mapped and digitized, approximately 490,000 acres are inland and coastal wetlands (not including open water areas and their associated resources).	Of the 81% of the state that has been mapped and digitized, approximately 545,000 acres are inland and coastal wetlands (not including open water areas and their associated resources).	Of the 85% of the state that has been mapped and digitized, approximately 568,000 acres are inland and coastal wetlands (not including open water areas and their associated resources).
Areal extent, density, and distance to the outer edge of plant growth for several eelgrass (*Zostera marina*) aquatic beds in selected estuaries	Change Detection has continued to include the area from Cape Cod Canal north to the New Hampshire border.	Change detection has continued to complete all but the most western portions of Buzzards Bay to the R.I border. Complete statewide change data will be available in Summer 2003.	Change detection has been completed for the entire state. An historic mapping interpretation of the 1951 coverage is being completed and the entire dataset (1951, 1995, 2001) will be available on the Massachusetts GIS distribution system by March 2004.

Outcomes		FFY 2001	FFY 2002	FFY 2003
Acres of wetlands lost (through permitting process and estimate of acres lost from illegal fill) compared to:	**Acres of wetlands restored or replicated through the permitting**	Data not available Data not available NA *In response to EPA's comments on the 2001 PPA, the DEP reviewed these outcomes. The numbers for FFY2000 have now been determined to significantly underestimate total impact. DEP's current databases do not have the capability to track and report these outcomes. DEP's future automated databases associated with the Wetlands Change Project will be better able to generate this information.	Commencement of a new wetlands change procedure utilizing the wetlands datalayer that is currently being completed analyzes data from aerial photographs taken in 1993 or 1995 (depending on location) and compares them with aerial photographs taken in 2000. Initial draft results for the first 15% of the state (portions of Plymouth and Bristol counties) have been developed.	Wetlands change procedure has been completed for the eastern third of the state (Northeast and Southeast Regions). Accurate change data has been quantified for each community within these regions. Over 700 acres of previously mapped wetlands have been altered. A 104b3-funded project to research the local permit history of a significant portion of these wetlands change sites is indicating that over 50% of the wetland change covered in this permit research project are un-permitted.
	Acres of wetlands restored or replicated due to enforcement	Data not available	Data not available	Data not available

Outputs	FFY 2001	FFY 2002	FFY 2003
Report on progress of statewide mapping of wetlands and coastal eelgrass	➢ Compilation of statewide wetlands GIS data layer is 71% complete, and ➢ Wetland interpretation and fieldwork was completed in Worcester County. ➢ Wetlands conservancy maps were distributed to conservation commissions in Worcester County. ➢ A 5 year eelgrass change detection has been completed in the Martha's Vineyard, Nantucket, Cape Cod, South Shore, Boston Harbor and North Shore areas. This project will be completed during 2002 with the Buzzards Bay area.	➢ Compilation of statewide wetlands GIS data layer is 81% complete, and ➢ Wetland interpretation and fieldwork was completed in Worcester County. ➢ Wetlands conservancy maps were distributed to conservation commissions in Bristol and portions of Hampden counties. ➢ The eelgrass change detection project completed all of Buzzard's Bay except for the most western portion from New Bedford to RI border. Entire project will be completed in the Spring 2003 season and the Statewide Change data will be available Summer 2003. ➢ Commencement of a new wetlands change procedure utilizing the	➢ Compilation of statewide wetlands GIS data layer is 85% complete. ➢ Wetland interpretation and fieldwork was completed in the following watersheds: Connecticut, Millers, Quinebaug, and French. ➢ Wetlands Conservancy Program maps were distributed to conservation commissions in the following watersheds: Blackstone, French, Quinebaug, and portions of the Connecticut and Chicopee. ➢ The eelgrass change detection project completed all of the state. ➢ Wetlands Change Program has completed over 50% of the state. All of the state east of the Connecticut River will be

		wetlands datalayer currently being completed. Initial draft results for the first 15% of the state (portions of Plymouth and Bristol counties) have been developed.	completed by March 2004.

Trend Analysis

- Compilation of statewide wetlands GIS data layer is 85% complete.
- Wetland interpretation and fieldwork was completed in the following watersheds: Connecticut, Millers, Quinebaug, and French.
- Wetlands Conservancy Program maps were distributed to conservation commissions in the following watersheds: Blackstone, French, Quinebaug, and portions of the Connecticut and Chicopee.
- The eelgrass change detection project completed all of the state.
- Analysis of wetlands change has been completed for 50% of the state. All of the state east of the Connecticut River will be completed by March 2004.

List of References of work products submitted or available

Other Work Products

DEP also published the following documents:

- "Small Docks and Piers, A Guide to Permitting Small Pile-Supported Docks and Piers" was published, distributed, and posted to DEP's web site.
- The brochure "Chapter 91, The Massachusetts Public Waterfront Act" was published, distributed, and posted to DEP's web site.
- Substantial progress was made in finalizing the Final Generic Environmental Impact Report (FGEIR) for Lakes and Aquatic Plant Management. This document, a collaborative effort between the DEP, the Department of Conservation and Recreation (formerly Department of Environmental Management), and the Citizens Advisory Committee (CAC), will result in public hearings in the winter of 2004.
- Substantial progress was made in developing "Guidance for Aquatic Plant Management in Lakes and Ponds as it Relates to the Wetlands Protection Act," a companion document to the Lakes FGEIR. Expected issuance date is February 2004.
- A final decision was obtained in the variance issued for the Greenbush Commuter Rail Line restoration project. This milestone allows Massachusetts to achieve partial compliance with the State Implementation Plan for air quality mitigation associated with the Central Artery construction.

Waste Prevention Operational Goal #1: National Air Strategy (Ensure Massachusetts citizens have clean air to breathe)

What needs to be done

- Reduce ozone-forming emissions from mobile sources in order to help achieve the current ozone standard set by EPA to protect public health, while accommodating population and economic growth
- Reduce ozone-forming emissions from large and small industries, electric generating facilities and consumer products in order to help achieve the current ozone standard set by EPA to protect public health, while accommodating population and economic growth
- Manage the growth and emissions of criteria pollutants (other than ozone), including fine particulate matter (PM2.5), consistent with maintenance and deposition plans, and in accordance with the standards set by the EPA to protect public health, while accommodating population and economic growth
- Complete PM2.5 network and begin to understand the relationship of ozone to PM2.5 pollution (NOTE: AAB had insufficient resources to perform analysis of possible relationship between PM2.5 and O3 in FFY02. We plan on working on this in FFY03 in the unlikely event that resources allow)
- Reduce acid deposition in Massachusetts and its contribution to acid deposition elsewhere, and
- Reduce toxic emissions

2003 Highlights in meeting goal

In 2003 DEP had several successes in advancing this goal. These included:

- The Governor submitted his recommendations to EPA for 8-hour non-attainment status and boundaries
- Issued as of 9/30/03, 103 Air Operating Permits
- Implemented the power plant regulations, 310 CMR 7.29, continued. Began to see SO2 reductions due this regulation ; FFY 2003 SO2 emissions were 244.2 tons below FFY 2002
- Drafted regulations for the Public Benefit Set Aside under 310 CMR 7.28 to encourage energy efficiency and renewable energy were proposed.
- Implemented the first year of the lower NOx emissions cap under the OTC MOU and NOx SIP Call, with a decrease in NOx emissions of 3504.6 tons from ozone season 2002 to ozone season 2003. Ozone season 2003 NOx emissions were approximately 9168.4 tons, well below the cap of 12861 tons
- Completed 1999 Periodic Emissions Inventory and submitted to EPA
- Implemented daily PM 2.5 forecasting on an annual basis.
- The PM2.5 network was reconfigured to make it more targeted and manageable; 4 continuous PM instruments were added to the network, 1 aethalometer was installed for measuring black carbon, and PM coarse measurements began at 5 sites.
- Published 2002 Annual Report for the Massachusetts Inspection and Maintenance Program

- Published MA31 Conversion Factor Analysis and Interim Test Effectiveness Evaluation for the Inspection and Maintenance Program
- Initiated a program assessment and redesign of the Inspection and Maintenance Program which will continue into FFY04
- Continued the administrative process to adopt the Onboard Diagnostic Regulations (regulations promulgated after time frame covered by this report)
- Launched Solid Waste Municipal Waste Combustor Web Site which presents the concentrations of contaminants found through stack testing
- Continued to work with EOTC and MBTA to ensure continued implementation of the transportation mitigation measures negotiated as a part of the Central Artery Project
- Adopted modification to the Zero Emissions Vehicle and Low Emission Vehicle programs
- Negotiated an Administrative Consent Order with the Salem Power Plant to settle their appeal of the Emission Control Plan issued under CMR 7.29 (the Clean Air Now power plant regulations)
- Held four stakeholder meetings to help MADEP design an Emission Reduction Credit program to implement the C02 control provisions of CMR 7.29 (the Clean Air Now power plant regulations) and began drafting the regulations
- Issued the Mercury Technology Report -- an analysis of the economic and technical feasibility of Mercury controls for power plants

Environmental Indicators and other Performance Measures

Environmental Indicators	FFY 2001	FFY2002	FFY2003
2002 Trends in air quality for carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, particulate matter, ozone, precursor volatile organic compounds, and oxides of nitrogen concentrations from the air monitoring networks‡ (calendar years)	➢ From 1999 to 2001: CO average annual 8-hour values have declined from 3.9 to 2.6 ppm. Well below the standard of 9 ppm. NO_2 annual average experienced no change during this period. Staying at 0.015 ppm SO_2 average annual average, while well below the standard of 0.030 ppm, is up from 0.004 to 0.006 ppm. ➢ From 1999 to 2001: PM_{10} down by 8%	➢ **From 2001 to 2002:** **See 2003**	**From 2001 to 2003** ***(averaged across all monitors available for each pollutant)*** ➢ CO average annual 8-hour values have declined from 2.6 to 1.9 ppm, well below the standard of 9 ppm. ➢ NO_2 annual average values declined slightly from 0.015 to 0.013 ppm (standard = 0.05 ppm). ➢ SO_2 average annual average levels have not changed from 0.005 ppm (standard = 0.030 ppm). ➢ $PM_{2.5}$ has declined somewhat in annual

‡ Environmental Indicators marked with this symbol are Core Performance Measures.

	➢ From 1999 to 2001: Pb values have been stable at levels well below the standard. ➢ From 1999 to 2001: O_3 the trend in number of one hour ozone exceedance days has been stable ➢ From 1999 to 2001: O_3 the trend in number of 8-hour ozone exceedances days has shown an increase of ~23 % (from 22 to 27).		averages over all sites (12.7 to 11.3 µg/m^3), although the 98th percentiles have increased from 32 to 36 µg/m^3. All monitors are measuring levels below the standard for both the annual and daily standard. ➢ PM_{10} has declined slightly from an annual average of 23 to 21 µg/m^3 (standard = 50 µg/m^3). Individually all monitors are measuring levels well below the standards. ➢ Pb values have been stable at levels well below (<0.1) the standard of 1.5 µg/m^3 . (*2003 data not yet available)* ➢ O_3: the number of 1-hour ozone exceedances has fluctuated with no clear trend**.** The average maximum values have remained stable. ➢ O_3: the number of 8-hour ozone exceedances has fallen from 125 to 34; however, there is no clear trend when longer term data is included. The average 4th maximum value has remained stable.
# and % of Massachusetts residents exposed to air that meets the NAAQS for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (including 2.5), and lead (Pb) (calendar years)	• 6.1 million (100% of MA residents) were exposed to air that meets the standards for NO2, CO, SO2, PM10, Pb. • Ozone standards are based on a 3-year average; there is a 1-hour and 8-hour standard. For the 2001-- - 2003 period, at 10 out of 12 monitors located throughout the state, MA residents were exposed to air the does not meet the 8-hour ozone standard. Residents of Western MA were exposed to air that also does not meet the 1-hour standard during that 3-year period. The rest of the state is in compliance with the 1-hour standard for the 2001-2003 period. • PM2.5 standards are based on a 3-year average. As of the end of calendar year 2003, no monitors in MA violated the annual or daily standards for PM2.5. Previously discontinued monitors had also recorded levels that did not violate the standards by the time of their closure. Therefore, based on available data, MA residents were exposed to air that meets the PM2.5 standards between 2001 and 2003. Due to low data capture, however, most PM2.5 monitors cannot be definitively classified as in attainment of the standards		
Ozone precursor (VOCs	Data not available	Data not available	Data not available –

and NO_x concentrations) upwind and downwind of Massachusetts (calendar years)			
Wet deposition; acidity of water bodies susceptible to acidification	Data not available		

Outcomes	FFY 2001	FFY 2002	FFY 2003
# of nonattainment areas and their associated populations that reach attainment, (including the number of ozone nonattainment areas that meet the 1-hour ozone standard)‡ (calendar year)	On April 22, 2002 the cities of Lowell, Springfield, Waltham and Worcester were redesignated to attainment for CO.	There has been no change in the attainment status during this period.	**No change in 1-hour attainment status. In July, the Governor recommended 8-hr non-attainment status for the entire state. (Final designations will be made in April 2004.)**
Emissions reductions since 1990 for each criteria pollutant‡	Emission change from 1990-1999: VOC: -24% NOx: - 6% SO_2: -47% **CO -21%**	**DEP has continued to refine the 99 inventory data. The following are estimated changes in emissions based on the 99 inventory , which will be finalized in early 2003.** **Emission change from 1990-1999:** **VOC: -24%** **NOx: - 7%** **SO2: -40%** **C0: -21%**	**Based on final revisions to 99 inventory:** **Emission change from 1990-1999:** **VOC: -25%** **NOx: - 7%** **SO2: -32%** **CO: -21%**

Outputs	FFY 2001	FFY 2002	FFY 2003
Redesignation of areas attaining the current NAAQS, revocations of the 1-hour ozone NAAQS for areas attaining it, and designations of areas for the 8-hour ozone and PM-2.5 NAAQS‡	Implementation of the 8 Hour Ozone Standard has been delayed due to national litigation. 8-hour designations are not expected till 2004 On April 22, 2002 US EPA redesignated Lowell, Springfield, Waltham and Worcester to attainment for CO; entire state now meets CO NAAQS. $PM_{2.5}$ designations on hold due to national litigation.	No change in attainment status during this period.	**MA recommended state-wide non-attainment status under the 8-hour ozone standard in July 2003 . (Designations will be finalized in April 2004.)**

‡ Outcomes marked with this symbol are Core Performance Measures.
‡ Outputs with this symbol are Core Performance Measures.

# of gas stations and automotive dealers trained and certified in the Enhanced Inspection and Maintenance Program	➢ In 2001, the number of inspection stations increased to 1,569 (1,446 of these are open to the public and 123 service fleets) ➢ Inspectors number between 3500 and 4000; more than 800 auto technicians are trained in emissions repairs.	➢ In 2002, the number of inspection stations increased to 1,576 (1,453 of these are open to the public and 123 service fleets) ➢ Inspectors remain between 3500 and 4000; more than 800 auto technicians are trained in emissions repairs.	➢ In 2003, 1579 stations tested vehicles (1470 open to the public an 109 service fleets) ➢ Inspectors numbered 4,560. Over 950 were trained in emission repairs and are associated with over 650 registered repair shops.
# of gas stations self certified in the Stage II Vapor Recovery Program	1,124 Certification Forms received. (Note: The Stage II Reporting requirement was phased in during FFY01. FFY02 is the first year that all facilities were required to report).	2,810 Certification forms received	3,508 Certification forms received
# of companies with 1,000+ employees which have submitted Rideshare Reports	238 Reports as of 9/30/01	242 Reports from 10/1/02 to 9/30/02	224 Reports from 10/1/02 to 9/30/03

Trend Analysis

AMBIENT AIR QUALITY AND EMISSIONS

Despite increases in activities that contribute to air pollution such as fuel use, economic activity, and vehicle miles traveled, Massachusetts' air quality has improved significantly over the 18-year period from 1985 to 2003. Massachusetts air complies with the National Ambient Air Quality Standards (NAAQS) for Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Lead (Pb), Particulate Matter –10 (PM_{10}), Nitrogen Dioxide (NO_2).

All PM 2.5 monitors in the state are measuring levels below the PM 2.5 standards. Ozone is the only NAAQS that MA is violating.

However, the number and magnitude of exceedances of the 1-hour ozone standard have declined significantly since the 1980s. The improvements in the 1-hour ambient ozone levels have coincided with the implementation in-state and throughout the Ozone Transport Region (the "northeast corridor") of major state and federal programs designed to reduce ozone precursor emissions from industries, power plants, vehicles, and consumer products that contribute to ambient air pollution. Additional reductions in precursor emissions, especially from upwind sources, will be needed if Massachusetts is to see further reductions in 1-hour exceedances and to attain the 8-hour ozone standard that was adopted in 1997.

Ambient Air Quality

NAAQS Pollutants

DEP's air quality monitoring network for criteria pollutants has measured the following changes:

- **CO** concentrations have declined by 71% from 1985 to 2003
- **SO_2** concentrations have declined by 55% from 1986 to 2003
- **NO_2** concentrations have declined by 56% from 1985 to 2003
- **Pb** concentrations have declined by 96% from 1987 to 2003

- **PM_{10}** concentrations have declined by 27% from 1989 to 2003

The trends for SO_2, CO, NO_2, Pb, and PM_{10} have been relatively stable over the last six years, at levels below the applicable standards.

Exceedances of the 1-hour Ozone (0_3) standard have declined from a range of 17-101 exceedances per ozone season over the 1987 – 1995 period to 10 or less per ozone season since 1995, with the exception of 2002 when there were 22 exceedances. The number of *days* when the 1-hour standard was exceeded dropped from around 10 per ozone season during the late 1980s and 1990s to 5 or fewer days per ozone season in the most recent 3 years.

The number of days that the more stringent 8-hour O_3 standard has been exceeded, however, has been fairly stable over roughly the same time period (typically in the 20-30 day range)However, the total number of measured 8-hour exceedances at all monitors (as opposed to days on which the standard was exceeded at one or more monitors) has displayed less stability, ranging from a high of 243 in 1988 to a low of 15 in 2000. The average number of measured 8-hour exceedances per year has been 83 over the period 1985 to 2003.

Ozone, in particular, can exhibit striking year-to-year variations since meteorological fluctuations significantly influence the chemical processes that produce ozone as well as the quality of the air masses entering Massachusetts.

PM2.5 average annual means have generally declined since monitoring started in 1999 (the average annual mean for sites existing in 2003 is down from 12.7 ug/m^3 in 1999 to 11.3 in 2003). However, average peak values represented by the 98^{th} percentile have fluctuated between 30 and 40 ug/m^3 over the same period with no clear trend (for sites existing in 2003). More data will be needed to determine whether these constitute a longer term trend.

Air Toxics data from the PAMS Network (1998 to 2003)

Lynn and Chicopee Data: MADEP collects 24-hour hydrocarbon and carbonyl samples every six days year round at the Lynn and Chicopee sites. Values for several health relevant compounds (formaldehyde, acetaldehyde, benzene, toluene, and xylene) are extracted from either the hydrocarbon or carbonyl analyses. The data gathered at the Lynn and Chicopee PAMS sites show a relatively large decrease in benzene, toluene and xylene values between 1994 and 1995, likely the result of the use of reformulated gas, first introduced in 1995. However, the trend for these three chemicals for the past four years has been relatively flat.

Roxbury and Long Island Data: In 2000 DEP began collecting selected air toxic samples at the Roxbury and Long Island monitoring sites. At the present time insufficient data exists to make a trend analysis. (Note: Long Island air toxics sampler discontinued in 2002; Lynn has been designated for air toxics since then.)

Ozone Precursors Trends Analysis:

Benzene, Toluene, and Xylenes levels monitored in Lynn and Chicopee since 1994 have declined by approximately 70% since 1994. However most of that decline occurred between the 1994 and 1995 monitoring seasons, probably as a result of reformulated gasoline being introduced in 1995. Ethyl Benzene values have stayed relatively stable during the entire period. Over the past four years values for all these compounds have been relatively flat.

While the 18-year (1985-2003) trend for NO_2 indicates a decline in annual NO_2 average values of approximately 56%. The 6-year NO_2 trend (1997-2002) had reached a plateau, with an annual NO_2 average of approximately 0.015 ppm being observed during this period. However, in 2003,

NO2 levels dropped to 0.013. These concentrations are all well below the ambient NO_2 standard of 0.053 ppm.

Emissions Reductions Trends Analysis

Emissions inventories are updated every three years, so trends can only be shown from 1990 through the date of the latest periodic inventory. The following trends are based on data compiled for the 1999 Emissions Inventory which was submitted to EPA in April, 2003. The trends illustrate success in moving toward the goal of ensuring that citizens have clean air to breathe, and corroborate the gains seen in ambient air quality. Programs that are being implemented subsequent to 1999 such as Enhanced Inspection and Maintenance and California Low Emission Vehicle Standards will ensure continued downward trends in emissions of motor vehicle-related criteria pollutants and their precursors, and should lead to continued progress toward attainment of the 1-hour ozone standard, and continued attainment of the standards for the other pollutants. Progress on the 8-hour standard will be dependent on further national, regional and state emission reduction programs.

VOC Emissions Trend: 1990 to 1999: - 25 %
The 1990 to 1999 VOC reductions are the result of controls that DEP implemented to meet provisions of the federal Clean Air Act (CAA) Amendments of 1990 for geographical areas not meeting the health-based ozone ambient standards. These control measures include: Basic automobile emission control Inspection and Maintenance (I/M), Federal Motor Vehicle Control Program**,** California LEV since 1995, Reasonable Available Control Technology (RACT) requirements for point sources, Stage II Vapor Recovery for Gasoline Stations, Architectural Coatings (i.e., lower paint emissions), and Reformulated Gasoline. On-road mobile VOC emissions were reduced by 34% during this period, despite a 15% increase in vehicle miles traveled.

NOx Emissions Trend: 1990 to 1999: - 7%
The 1990-1999 NOx reductions are based on controls that DEP implemented to meet the NOx provisions of the federal Clean Air Act (CAA) Amendments of 1990 for geographical areas not meeting the health-based ozone ambient standards. Emission reductions from 1990 to 1999 were derived from control measures such as: Basic I/M, Federal Motor Vehicle Control Program, California LEV and Reasonable Available Control Technology (RACT) on combustion units on point sources (industries, utilities). These reductions were achieved despite overall economic and industrial growth during this time period.
Point source NOx emissions, primarily power plants, were reduced by 43% for this period. This significant decrease was partially offset by a on-road and off-road mobile emissions which increased by 8%, and 19% respectively. NOx mobile emissions increased in part because early mobile-source controls were targeted toward VOCs. NOx controls have been put in place more recently and their affect will be reflected in future years as the vehicle fleet turns over.

SO_2 Emission Trends: 1990 to 1999: - 32 %

SO_2 emissions are tracked annually as part of the requirements of the 1985 State Acid Rain (STAR) program. Nearly all SO_2 emissions are from large point sources, especially power plants. The STAR program established a 412,000-ton state cap, which is more stringent than the federal acid rain program. The SO_2 emission estimate for 1999 is 257,000 tons, which is significantly lower than the cap. Reductions are the result of new emission controls.

CO Emission Trends: 1990 to 1999: - 21%

There was a 43% reduction in on-road mobile emissions during this period as a result of the mobile source programs described above under VOC and NOx trends. This decrease in mobile emissions was offset by a 14% increase in off-road CO emissions, which is largely attributable to economic growth. There was a 13 % decrease during this period in point source CO emissions.

List of References of Work Products Available

Regulations

The following regulations and polices were published or worked on in FFY03:

- NOx Budget Information: The Summary and Technical Support Documentation for Amendments to CMR 7.28 NOx Budget Program
- Low Emission Vehicle Regulations: The amendments to regulations to adopt the California Zero Emission Vehicle (ZEV) mandate in May 2006 and the alternative compliance plan in May 2004
- On Board Diagnostic Testing Regulations for the Vehicle Inspection Program
- Began drafting C02 emission control regulations
- Draft Mercury Regulations for Power Plants

Other Work Products

AIR MONITORING WORK PRODUCTS

- Ambient air data entered into EPA's AIRS database.
- 2002 Air Quality Report was published
- The following QAPPs were submitted to EPA:

  NAAQS QAPP - Revised version to address EPA first review comments 12/5/02

  NATTS QAPP - National Air Toxics Trends Sites 6/16/03

  Dump QAPP - Secondary Data Research Project 6/5/03

  NAAQS PM 2.5 QAPP - Revised version to address EPA first review comments 3/25/03

- The following new instruments were installed and began operation:

  4 continuous PM monitors (BAMs) at Worcester, Springfield, Fall River and Blue Hill monitoring sites.

  6 PM coarse monitors at Ware, Springfield Union News, Boston Kenmore, Boston Charlestown, Boston Roxbury, and Worcester FD sites.

  1 aethelometer at the Boston North End site.

  1 NOx monitor at the Blue Hills site

Other Air Work Products

- Prepared Report: Air Toxics in Massachusetts, How DEP is Addressing Air Toxics
- Held four stakeholder meetings to help MADEP design an Emission Reduction Credit program to implement the C02 control provisions of CMR 7.29 (the Clean Air Now power plant regulations)
- Published Evaluation of the Technological and Economic Feasibility of Controlling and Eliminating Mercury Emissions from the Combustion of Solid Fossil Fuels
- Published Commonwealth Of Massachusetts 2001 Air Quality Report
- Issued Final 2002 Ozone-Smog Forecast For The Year: 29 days were recorded as exceeding federal ozone standards in 2002

What Must Be Scaled Back	Activities Planned For FFY 03 That Were "Parked" Or Scaled Back Due To State Budget Cuts **Photochemical Assessment Monitoring Stations (PAMS) program.** Losses of experienced staff that could not be replaced resulted in less timely response to problems in the field, with likely loss of data. Data processing is also delayed (it is still on-going) so the quantity of data loss is yet undetermined because not enough of the 2003 data has been processed.

Waste Prevention Operational Goal #2: Pollution Prevention

What needs to be done

- Decrease the use of toxic substances
- Decrease the toxicity of all waste streams, and
- Decrease the amount of solid and hazardous waste generated.

2003 Highlights in meeting goal

In 2003, DEP had several successes in advancing this goal. These included:

- Awarded 61 Massachusetts Cities and Towns: $394,000 in state recycling grants: these recycling grants are to promote waste reduction and recycling
- Awarded Three Massachusetts Companies Recycling Industries Reimbursement Credit Grants: $150,000 for efforts to increase demand for recycled materials each will receive up to $80,000
- Published 2002 Waste Reduction Program Update
- Published 2001 Toxics Use Reduction Information Release, showing that toxic byproducts decreased 69% form 1990 to 2001 and toxics chemical use decreased by 45%
- Established Toxics Use Reduction Act (TURA) electronic reporting for the first time.

Environmental Indicators and other Performance Measures

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
Trends in emissions of toxic air pollutants (TRI supplemented by TURA)‡	Air releases of hazardous air pollutants decreased by 47% from 1990 to 2000, from 23.6 to 12.5 million pounds	Air releases of hazardous air pollutants decreased by 58% from 1990 to 2001, from 23.6 to 9.9 million pounds	2002 Data will be available in April 2004
Air toxics ambient data from the state's special ozone monitoring network and special monitoring studies (calendar years)	➢ In 2000 at the Lynn monitoring site, benzene was at .2 ppbv; toluene was at .6 ppbv; ethyl benzene was at .1 ppbv; xylenes were at .4 ppbv, and ➢ In 2000 at the Chicopee monitoring site, benzene was at .4 ppbv; toluene was at .9 ppbv; ethyl benzene was at .1 ppbv; xylenes were at .5 ppbv	➢ In 2001 at the Lynn monitoring site, benzene was at .25 ppbv; toluene was at .5 ppbv; ethyl benzene was at .05 ppbv; xylenes were at .3 ppbv, ➢ In 2001 at the Chicopee monitoring site, benzene was at .3 ppbv; toluene was at .5 ppbv; ethyl benzene was at .1 ppbv; xylenes were at .3 ppbv	➢ In 2002 at the Lynn monitoring site, benzene was at .2 ppbv; toluene was at .5 ppbv; ethyl benzene was at .02 ppbv; xylenes were at .1 ppbv, ➢ Chicopee 2002 data not yet available.
Fresh water fish tissue concentrations of mercury	.40 mg/kg (ppm) at 10 locations	0.38 mg/kg from 22 locations 397 fish	0.48 mg/kg from 18 locations 574 fish

Outcomes	FFY 2001	FFY 2002	FFY 2003
Reductions in air toxic emissions from 1990 levels‡	DEP Submitted toxic inventory data for an additional area source category Stage II Refueling, in July 2002. DEP reviewed and submitted revisions to EPA's toxic inventory data in February 2002.	DEP submitted toxic inventory data for an additional area source category Stage II Refueling, in July 2002. DEP reviewed and submitted revisions to EPA's toxic inventory data in February 2002.	No additional data is available.
Reduction in daily toxic emissions resulting from the Enhanced Vehicle Maintenance Program, effective 10/1/99	This indicatory is still under development pending finalization of EPA's Mobile v. 6.2 toxics model.	This indicator was dependent on finalization of EPA's Mobile v. 6.2 toxics model, which was just completed. Therefore that data is not yet available.	As of 2/04 still pending finalization of EPA's Mobile v. 6.2 toxics model. Therefore that data is not yet available.
Reduction in daily toxic emissions resulting from the Stage II Vapor Recovery Program	This indicator is still under discussion with senior management		
Emissions of air toxics, other heavy metals including VOCs (calendar years)	See above regarding toxics inventory development and below regarding stack test data for mercury. VOC data reflects a 24% reduction in VOC emissions from 1990-99. However not all VOCs are toxics.	No change from last year to report	No change from last year to report
# of mercury fresh water fish advisories/concentration of mercury in fish	**In 2001, 8 new mercury fish advisories had been issued for water bodies.** **84 fish advisories for mercury were pre-existing.**	14 water bodies were tested, and are being evaluated for possible advisories. As of October 2002, the MA DPH had issued 92 mercury fish advisories for water bodies.	18 water bodies were tested and are being evaluated for possible advisories, which will be issued in spring of 2004.
Amount of mercury diverted from the waste stream	In CY01: 1853.6 lbs	Data will be available in spring of 2004	Data will be available in spring of 2004
Stack tests results from sources emitting mercury and subject to testing requirements	.28 tons were emitted A 71% reduction from last year.	.28 tons emitted from 7 municipal waste combustor facilities in CY2002	Data will be available in spring of 2004
% of non-product outputs reduced for TURA reporters	From 1990 to 2001, toxic byproducts were reduced by 57%	Data will be available in spring of 2004	Data will be available in spring of 2004
% of non-product outputs reduced for TURA reporters with waste normalized for production	From 1990 to 2001, toxic byproducts were reduced by 69% when adjusted for production	Data will be available in spring of 2004	Data will be available in spring of 2004
Quantity (# of lbs.) of toxics used and generated as waste by-products (calendar year)	Use: 1.3 billion pounds in 2001 (down from 1.4 billion pounds in 2000) Byproduct: 112.8 million pounds in 2000 (down from 127.8 million pounds in 2000)	Data will be available in spring of 2004	Data will be available in spring of 2004

Outputs	FFY 2001	FFY 2002	FFY 2003
State progress in collecting and compiling ambient and emission source data for toxics to better understand the nature and extent of the air toxics problem‡	Roxbury 2000 mean value 1,3-butadiene 0.09 ppb 1,1,1-trichloroethane 0.05 ppb trichloroethylene 0.01 ppb tetrachloroethylene 0.04 ppb benzene 0.47 ppb toluene 1.30 ppb xylenes 0.79 ppb ethylbenzene 0.18 ppb Long Island 2000 mean value 1,3-butadiene 0.02 ppb 1,1,1-trichloroethane 0.05 ppb trichloroethylene 0.01 ppb tetrachloroethylene 0.02 ppb benzene 0.22 ppb toluene 0.40 ppb xylenes 0.22 ppb ethylbenzene 0.06 ppb As a result of its reexamination the toxics monitoring program the Long Island toxic sampler was relocated to the Lynn monitoring site in 2002	**2002 mean values (ppb)** Rox L.Isl Lynn 1,3-butadiene 0.06 0.02 0.02 1,1,1-trichloroethane 0.03 0.01 0.004 trichloroethylene 0.01 0.01 0.004 tetrachloroethylene 0.01 0.02 0.03 benzene 0.36 0.23 0.19 toluene 0.95 0.41 0.33 xylenes 0.47 0.25 0.09 ethylbenzene 0.23 0.13 0.05 **2001 mean values (ppb)** Rox L.Isl 1,3-butadiene 0.06 0.02 1,1,1-trichloroethane 0.06 0.03 trichloroethylene 0.02 0.01 tetrachloroethylene 0.05 0.03 benzene 0.37 0.19 toluene 0.84 0.34 xylenes 0.16 0.06 ethylbenzene 0.15 0.06 The Long Island sampler was relocated to Lynn. Carbonyl sampling at Chicopee was suspended due to staffing shortages (resumed in 2003). The Agawam monitoring site was discontinued with its sampling equipment relocated to Ware. Blue Hill became operational as a Type 1 PAMS site. PAMS equipment moved from Truro to Fairhaven for the 2002 season for evaluation. This equipment will be returned to Truro in 2003 as the Fairhaven location was found to provide no additional benefit. No toxic data has been submitted to AIRS because we lack the necessary resources to convert the data into the format that would be acceptable to the AIRS system.	A PM 10 sampler was installed at the Roxbury toxic site that will begin sampling for toxic metals in 2004. A GC was installed at the Ware PAMS site to allow hourly data to be collected. An aethelometer was installed at the North End site. No toxic data has been submitted to AIRS because DEP lacks the necessary resources to convert the data into the format that would be acceptable to the AIRS system**.**
Technical assistance efforts	Technical assistance efforts are indicated with *	Technical assistance efforts are indicated with*	Technical assistance efforts are indicated with*
# of Toxics Use Reduction Trainings regarding Reporting Guidance	6 Trainings*	9 Trainings*	6 trainings in 2002*
# of ERP Sector Workshops Held	Held 3 industry association meetings (printers, photo processors and dry cleaners), several meetings with the Industrial Wastewater Advisory Group*	Held 1 ERP Workshop/Celebration for dry cleaners, photo processors, printers and boilers. *	**None**

‡ Outputs marked with this symbol are Core Performance Measures.

# of ERP Companies in the System	Over 95% of ERP companies are in the system including about: 1,100 printers, 650 dry cleaners, and 500 photo processors.	Over 95% of ERP companies are in the system including about: 1,100 printers, 650 dry cleaners, and 500 photo processors	Approximately 90% of ERP companies are in the system: 800 printers, 600 drycleaners, 500 photo processors
# of new ERP industrial sectors developed	One new sector developed – boilers	One new sector developed - industrial wastewater holding tanks Regulations for Industrial Wastewater Sewer Redesigned drafted. Implementation parked because of state budget cuts.	None Six new sectors are under consideration
Publication of TURA Information Release	Published 1999 Toxics Use Reduction Information Release	Published 2000 Toxics Use Reduction Information Release	Published 2001 Toxics Use Reduction Information Release
Amount of solid waste diverted from the waste stream through Bottle Bill redemptions	76, 514 tons in calendar year 2000.	76,368 tons in 2001	76,257 tons in 2002
Regulations	See Regulation Section	See Regulation Section	See Regulation Section
# of inspections			
# of enforcement actions			

Trend Analysis **MERCURY WASTE DIVERSION TRENDS**

In Calendar year 2000 DEP launched aggressive effort to divert mercury from the waste streams. In the first two years of the effort, 3,597 pounds of mercury have been collected and recycled or properly disposed of.

- In CY 2000 1,645 pounds of mercury were collected through the MA Dental Society Mercury Collection Program. This effort involved cleaning out old stocks of mercury amalgam that were no longer needed due to changes in amalgam technology. It is expected that mercury collections will continue, but the yield of mercury amalgam will be much less, since the larger stockpiles were cleared out in CY 2000.

- In CY 2001 12 TURA Filers reported using 9,298 pounds of mercury, shipping 8,620 pounds, generating byproduct or waste of 609 pounds. Filers reported using 676 lbs of mercury compounds, 4430 lbs shipped in products and 443 lbs generated or waste byproduct. CY 2000 was the first year TURA mercury reporting thresholds had been lowered to 10 lbs.

- In CY 2000 1.9 pounds of mercury were collected through the Thermostat Recycling Corporation's voluntary thermostat recycling program for professional plumbing and electrical supply contractors that sell directly to contractors. An additional 2.5 pounds were collected through this program in CY 2001. The program is expected to continue to grow and divert increasing numbers of thermostats in the coming years.

- In CY 2001, Municipal Waste Combustors were required to implement material separation plans pursuant to 310 CMR 7.08 (7). Implementation of these plans resulted in diverting from the waste stream 1,853.6 pounds of mercury contained in thermometers, switches, thermostats, fluorescent lamps and bulbs, and other miscellaneous products. Absent this requirement, much of this mercury would have ended up as air pollution. This program will continue in coming years.

- In CY2001 125 communities collected mercury containing items for diversion from the solid waste stream. Some of these collection efforts were sponsored by the Municipal Waste Combustors and contributed to the 1,853.6 pounds reduction cited above.

- In CY 2001 DEP supported the School Clean-out Pilot Projects through which 586 pounds of mercury were collected from 17 schools. This was in the form of jars of elemental mercury, thermometers, and barometers. An average of 14 pounds of mercury was collected per participating high school. Further school clean-out programs are planned and will be implemented in the future as funds allow.

- In CY2001, DEP supported the Keep Mercury from Rising Pharmacy Thermometer Exchange which collected 168 lbs of mercury*

AIR TOXICS EMISSIONS TRENDS FOR LARGE QUANTITY TOXICS USERS

Emissions of Hazardous Air Pollutants (HAPs) from large quantity toxics users declined by 42% between 1990 and 2001. Industrial facilities that employ more than 10 FTEs are required to report their HAP emissions for any HAP for which their use exceeds either 10,000 pounds a year or 25,000 pounds a year, depending on the way it is used in the manufacturing process. Thus these reductions reflect the behavior of the industrial facilities that use the greatest quantities of the individual HAPs.

Much of the reduction is due to pollution prevention activities. Facilities have substituted non-toxic cleaning processes for solvent-based processes using compounds such as toluene, tricholorethane and trichlorethylene. Ethylene Glycol is no longer being used for deicing, and the use of CFCs for cleaning, propellants, and cooling is also being phased out.

The reductions have tapered off as more and more companies have completed the substitution process. As this happens emissions of HAPs may begin to increase if production increases at Massachusetts's industrial facilities.

2002 data to update analysis not available until spring 2004

BYPRODUCT GENERATION TRENDS FOR LARGE QUANTITY TOXICS USERS

Byproduct is a measure of the efficiency with which companies use toxic chemicals. The byproduct is the amount of a given chemical that is "wasted" during the production process: that is, it is neither converted into another chemical during production (such as using one chemical to manufacture another compound at a chemical manufacturing plant) or is not incorporated in the product – as copper might be incorporated into a pot, or as a solvent might be incorporated into a can of paint. Some byproduct gets destroyed through pollution control equipment, but that which pollution control technology does not destroy leaves the site as emissions, hazardous waste, or discharges.

Changes in byproduct generation, normalized for changes in production levels, is a good measure of pollution prevention techniques, such as input substitution, improved production processes, or production equipment operation and maintenance.

Between 1990 and 2001, after normalizing for changes in production levels, the Core Group of TURA facilities reduced their byproduct generation by 69%, showing that these facilities used pollution prevention to increase efficiency and reduce waste.
Data to update analysis for 2002 not available until Spring 2004.

List of References of work products submitted or available

Regulations	No regulations and policies were completed 2003
Other Work Products	The following work products were produced in 2003: • Published ERP Compliance Certification Materials On Line. • Published Recycling Processor Survey • Issued 2001 Toxics Use Reduction Information Release • Updated Toxics Use Reduction Planners Directory • Established electronic reporting for the TURA Form S • Published the 2002 TURA Reporting Package and Guidance • Issued the Mercury Technology Report, an analysis of the economic and technical feasibility of mercury controls for power plants
What needs to be scaled back	FFY 02 ASSISTANCE ACTIVITIES THAT WILL BE SCALED BACK IN FFY 03 • Provide guidance and training to municipalities on household hazardous products collection centers *Scaled Back* • Provide financial and technical assistance to promote access to recycling and markets for recovered materials *Scaled Back* • Conduct Pollution Prevention Poster Contest involving over 400 elementary schools *Parked*

Waste Prevention Operational Goal #3: Safe Waste Management

What needs to be done

- Divert solid and hazardous waste from disposal through reuse and recycling, and
- Manage solid and hazardous waste streams in a way, which minimizes risk to public health.

2003 Highlights In meeting goal

2003 Highlights in Meeting Goal

- Issued 2001 Solid Waste Progress Report, showing that Massachusetts waste reduction rate increased from 51% in 1999 to 57% in 2001
- Completed Science Advisory Panel Report on Interim Risk Evaluation Guidance Document for Solid Waste Facility Site Assignment and Permitting

Environmental Indicators and other Performance Measures

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
At this time, no environmental indicators exist for this goal. EPA and states are developing indicators for future use.			

Outcomes	FFY 2001	FFY 2002	FFY 2003
% of hazardous waste managed at Treatment, Storage, and Disposal Facilities (TSDFs) with approved controls in place‡	100%	100%	100%
Annual generation of hazardous waste (# of tons) safely shipped	In 1997: 85,534 tons shipped	In 1999:43,681 tons shipped	In 2001: 55,862 tons shipped
# of RCRA notifiers who report releases under state Superfund regulations	Data not available.		
# of new sites created due to the mismanagement of hazardous waste	Data not available.		
Weight or volume of household hazardous wastes collected and reused, recycled or properly disposed	8,412 tons (7/1/00 – 6/30/01)	**13,670 tons in calendar year 2002**	**No Data for 2003 available until Spring 2004**
Total (# of tons) municipal solid waste generated (calendar year)	CY 2000: 7,990,000tons	**CY2001: 8,130,000 tons**	**Data not yet available**

‡ Outcomes marked by this symbol are Core Performance Measures.

Annual amount (# of tons) of solid waste diverted relative to the amount generated (calendar year)	CY 2000: All Waste: 6,500,000 tons= 50% MSW Only: 2,700,000 tons= 34%	**CY2001:** **All Waste: 6,450,000 tons= 50%** **MSW Only: 2,780,000 tons= 34%**	**Data not yet available**
Amount of solid waste disposed in landfills, resource recovery facilities relative to the total generated in-state (calendar year)	CY 2000:. All Waste: 6,460,000 tons= 50% MSW Only: 5,290,000 tons= 66%	**CY2001** **All Waste: 6,340,000 tons = 50%** **MSW Only: 5,350,000 tons= 66%**	**Data not yet available**
Volume of leachate collected at operating landfills (calendar year)	2001: 130 million gallons	**2002: 141 million gallons.**	**Data not yet available**

Outputs	**FFY 2001**	**FFY 2002**	**FFY 2003**
# of permits	Issued: ➢ 189 Hazardous Waste permits ➢ 21 Industrial Wastewater permits, and ➢ 118 Solid Waste permits, other than Beneficial Use Determinations.	Issued: ➢ 253 Hazardous Waste permits ➢ 17 Industrial Wastewater permits, and ➢ 117 Solid Waste permits, other than Beneficial Use Determinations.	**Issued** ➢ **303 Hazardous Waste permits** ➢ **17 Industrial Wastewater permits, and** ➢ **165 Solid Waste permits, other than Beneficial Use Determinations.**
# of Beneficial Use Determinations	22	32	**37**

Grant dollars distributed	Distributed in calendar year 2001 ➢ $1.8 million in recycling equipment and consumer education grants ➢ $1 million in grant assistance to redemption centers ➢ $2.5 million in grants to municipalities under the Recycling Incentive Program, and ➢ $.5 million in assistance to business recycling and research.	Distributed in calendar year 2002 ➢ $3.1 million in recycling equipment and consumer education grants* ➢ $1.375 million in grant assistance to redemption centers* ➢ $.5 million in assistance to business recycling and research* ➢ $1.65 million in waste reduction public education and outreach to schools* ➢ $1 million in grants to recycling related businesses under the Recycling Industry Reimbursement Credit Grant Program*. ➢ $1 million in waste reduction pilot projects and research grants*.	**Distributed in calendar year 2003** ➢ **$2.95 million in recycling equipment and consumer education grants** ➢ **$0 in grant assistance to redemption centers*** ➢ **$120,000 in assistance to business recycling and research*** ➢ **$160,000 in waste reduction public education and outreach** ➢ **$180,000 in Recycling Industry Reimbursement Credit** ➢ **$250,000 in waste reduction research and pilots**

Trend Analysis **MUNICIPAL RECYCLING GRANTS Updated 2/04**

In FY 2003, DEP and EOEA distributed $1.3 million in payments to 200 municipalities under the Municipal Recycling Incentive Program (MRIP), which provides performance-based grants to municipalities that demonstrate an increasing commitment to recycling over time. Since 1998, 270 communities have received over $13 million in MRIP payments. In its most recent six-month phase, municipalities achieved a 2% tonnage increase compared with the preceding year. Municipalities that have participated continually since 1998 have increased their recycled tonnage by 26 %.

In FY 2002, DEP and EOEA awarded $13 million in municipal recycling grants. Since 1990, DEP and EOEA have awarded over $24 million in recycling grants to a total of 259 municipalities. These grants include money for equipment for general recycling, computer and television recycling, composting, household hazardous products collection equipment, new Pay-As-You-Throw programs, and recycling education materials.

SOLID WASTE MANAGEMENT

Massachusetts overall waste reduction rate increased from 51% in 1999 to 57% in 2000 and remained at 57% in 2001. The state's goal is to reach a 70 % waste reduction rate by the year 2010.

In 2001, waste generation decreased for the first time since 1997, dropping 1 percent from 2000 to 2001. This compares to a 6 percent increase from 1998 to 1999. At the same time, the amount of waste disposed in 2001 decreased 2 percent from 2000, the second consecutive decrease in total disposal. These were the first decreases in disposal since 1995. Overall recycling decreased from 48% in 2000 to 46 % in 2001 due to a decrease in C&D recycling. The state's MSW recycling rate (excluding home composting) has been essentially flat for the past several years; at 33 percent in 1999, 34 percent in 2000, and 34 percent in 2001.

HAZARDOUS WASTE MANAGEMENT, Updated 2/04

Data from BRS needed to update this section is not yet available.

Between 1997 and 2001 the quantity of hazardous waste shipped in Massachusetts from 85,534 tons shipped in 1997 to 55, 862 in 2001 or a 35% reduction.

In CY 1997, 484.2 thousand tons of the hazardous waste generated but not treated on site was recycled or 79%. In CY 99, 504.5 thousand tons or 84% of the hazardous waste generated but not treated on site was recycled.
Data from BRS to update this analysis is not yet available

List of References of work products submitted or available

Regulations

The following policies and regulations were promulgated in 2003:

- Industrial Wastewater Holding Tank and Container Construction, Operations and Record Keeping Requirements
- Hazardous Waste Transporter Vehicle Identification Device (VID) Regulations and Fact Sheet

Other Work Products

- Published Hazardous Waste Requirements for Commercial Pesticide Users
- Published Fact Sheet: Use of Temporary Hazardous Waste Generator Numbers
- Published Safe Handling of Waste Oil for Burning in Space Heaters
- Published RCRA Authorization in Massachusetts

Municipal Stewardship

- Conducted four EMS municipal workshops. EMS workshops are put on for both the Municipal Stewardship and EMS in Public Schools Grant Programs. EMS municipal grant projects are moving forward in spite of significant reductions/changes in municipal staff and competing priorities. Grant participants have grasped the concepts of EMS and how they relate to their projects.

EMS Development in Public Schools Grant Program.

- The two grant projects are proceeding. The Healthy Schools "Checklist" was used to evaluate school buildings and was determined by the grant participants to be a very useful tool. Reductions and changes in municipal staff as well as competing priorities have slowed progress. However, grant participants have grasped the concepts of EMS and are moving forward with their projects.

What must be scaled back

No Activities Planned For FFY 03 Were "Parked" Or Scaled Back Due To State Budget Cuts

FFY 02 Assistance Activities Scaled Back In FFY 03

- Provide guidance and training to municipalities on household hazardous products collection centers
- Promote alternative and beneficial use of waste material
- Provide grants for recycling and composting equipment; recycling technical assistance; recycling incentive programs; transfer stations; "Pay as You Throw" Programs and research and development
- Provide general consumer education to raise awareness and participation in recycling, including a statewide education campaign
- Implement the Municipal Recycling Incentive Program to provide performance based grants to municipalities designed to increase access and participation in recycling programs
- Distribute funds from the recycling business development loan fund and Recycling Industry Reimbursement Credit to recycling-related businesses, in order to expand the markets for recycled materials and products

- Expand Household Hazardous Products Programs
- Participate in Buy Recycled Vendor Programs
- Conduct commercial outreach on waste bans
- Sponsor Massachusetts Recycles Day/Week of activities
- Promote environmental education and assistance in public schools through the Recycling Education Program and the Healthy Schools Program
- Publish guidance for household hazardous product collection centers
- Publish policies including pesticide contaminated soil management, Recycling Benefits Plans

Clean Up Waste Sites Operational Goal #1: Maximize risk reduction

What needs to be done

- Focus state resources and oversight on maximizing risk reduction opportunities
- Increase the effectiveness of state oversight
- Maintain the ability to respond to emergency situations

2003 highlights in meeting goal

In FY 2003, DEP was successful in advancing this goal:

- Maintain gains and compliance rates with fewer staff and resources
- Implement streamlining regulations that
  - Clarify the acceptability of electronic submittals
  - Eliminate the presumptive approval process for Release Abatement Measures
  - Establish a 45-day presumptive approval process for Tier I permits, major modifications, transfers, and extensions
  - Eliminate DEP approval of actions at Tier IA sites, but retain DEP's ability to require approval on a case-by-case basis
  - Establish a flat annual compliance assurance fee for Tier IA sites

Environmental Indicators and other Performance Measures

Environmental Indicators	FY 2001	FY 2002	FY 2003
At this time, no environmental indicators have been developed for this goal; many states, EPA, and organizations such as the Association of State and Territorial Waste Management Officials (ASTWMO) are working to develop appropriate indicators.			

Outcomes	FY 2001 (7/1/00 through 6/30/01)	FY 2002 (7/1/01 through 6/30/02)	FY 2003 (7/1/02 through 6/30/03)
# of sites where risks are reduced via response action measures	4,925 (as of 6/30/01)	4,397 (as of 6/30/02)	4,440 (as of 6/30/03)
# of sites where private parties have failed to meet deadlines	1,503 (as of 6/30/01)	1,362 (as of 6/30/02)	1,341 (as of 6/30/03)
# of sites permanently cleaned up (each year)	1,972	1,907	1,829
# and % of oil and hazardous material sites where IRAs have been taken by potentially responsible parties	Data are no longer collected in this fashion.		
# of sites where risks have been reduced by IRAs	1,534 (includes 33 DEP-conducted IRAs)	1,410 (includes 13 DEP- conducted IRAs)	1,368 (includes 19 DEP- conducted IRAs)
# of oil and hazardous material sites reporting a risk of immediate harm and percent of sites where the risk of immediate harm has been controlled	781 51%	824 58%	846 56%
% of immediate response actions performed by potentially responsible parties	98%	99%	99%
$ recovered as a result of DEP cost recovery actions	$3,104,517	$1,356,329	$561,241

Outputs	FY 2001 (7/1/00 through 6/30/01)	FY 2002 (7/1/01 through 6/30/02)	FY 2003 (7/1/02 through 6/30/03)
# of Tier I permits issued	127	148	111
# of IRAs approved	1,631	1,541	1,486
# of IRAs implemented by DEP	33	13	19
# of higher level enforcement actions	150	217	159

Trend analysis

- Notification rates and cleanups of waste sites are linked to economic activity. The fact that Massachusetts' economy has lagged behind the national recovery is reflected in several outcomes and outputs for FY 2003. Although not noted here, the number of new sites coming into DEP's database decreased over the PPA performance period by 12 percent. As a result, the universe of new sites decreased, explaining the decrease in the number of Tier I permits issued, the number of sites permanently cleaned up each year, and those where risks have been reduced by IRAs. Note, however, that the number of DEP-conducted IRAs increased (by 6) over FY 2002, reflecting BWSC's commitment to maintain its ability to act in time-critical situations, despite a 15 percent staff reduction in FY 2003.

- The continuing decrease in the number of private parties that have failed to meet MCP deadlines is attributable, at least in part, to the success of DEP's non-responder initiative.

- The significant decrease in cost recovery funds in FY 2002 and FY 2003 reflects the impact of the $2 million settlement with General Electric in FY 2001 that distorts the three-year trend analysis. Additionally, recovering costs from the parties responsible for sites where DEP has conducted remedial actions is a lengthy process that can take years to conclude and may bare no relationship to the number of DEP actions in any particular fiscal year.

- The number of HLE actions taken in FY 2003 decreased some from FY 2002, which was a particularly good year for this activity. It is, however, slightly higher but more in line with the numbers from FY 2001 and the 5-year average of 173. This variation reflects the cyclical nature of the enforcement program and staff reductions BWSC experienced during this period. What is not reflected in these data is the all-time C&E annual high for assessed penalties of more than $1 million.

List of References of work products submitted or available

Regulations

- DEP Fees and Program Improvements Regulation Package (http://Mass.Gov/dep/bwsc/regs.htm)

Other work products

The following guidance, policies and publications published in FY2002 are available on-line at http://Mass.Gov/dep/bwsc/bwschome.htm.

- Draft - Remedial Monitoring Transmittal Form
- Massachusetts Oil and Hazardous Material List (MOHML) searchable on line
- New and revised BWSC transmittal forms
  - BWSC104: Response Action Outcome Statement
  - BWSC106: Release Abatement Measures
  - BWSC115: Downgradient Property Status
  - BWSC119: Utility Related Abatement Measures
- Buzzards Bay Fuel Oil Spill Webpage
- Homeowners Certification form: BWSC120

Clean Up Waste Sites Operational Goal #2: Increase the rate and quality of privatized cleanup actions

What needs to be done

- Use compliance and enforcement to encourage private parties to take response actions and to ensure the quality of private response actions
- Integrate state and federal cleanup programs to maximize flexibility and accommodate state program priorities
- Provide clear rules, guidance, and education to assist private parties conducting response actions
- Implement program improvements and operational changes

2003 highlights in meeting goal

In 2003, DEP had several successes in advancing this goal:

- Maintain gains and compliance rates with fewer staff and resources
- Implement streamlining regulations that
  - Eliminate the presumptive approval process for Release Abatement Measures
  - Establish a 45-day presumptive approval process for Tier I permits, major modifications, transfers, and extensions
  - Eliminate DEP approval of actions at Tier IA sites, but retain DEP's ability to require approval on a case-by-case basis
  - Create a Tier ID disposal site category for sites where parties fail to tier classify by the deadline
  - Increase cleanups by lowering fees imposed on homeowners
  - Require only one permit fee for applications that include modifications, transfers and/or extensions for the same Tier I site

Environmental Indicators and other Performance Measures

Environmental Indicators	FY 2001	FY 2002	FY 2003
At this time, no environmental indicators have been developed for this goal; many states, EPA, and organizations such as the Association of State and Territorial Waste Management Officials (ASTWMO) are working to develop appropriate indicators.			

Outcomes	FY 2001 (7/1/00 through 6/30/01)	FY 2002 (7/1/01 through 6/30/02)	FY 2003 (7/1/02 through 6/30/03)
Program Outcome/Output: # of LUST cleanups initiated‡	167	95	89
Program Outcome/Output: # of LUST cleanups completed‡	403	132	225
# of sites permanently cleaned up (each year)	1,972	1,907	1,829
# of Release Abatement Measures (RAMs)	Not applicable.	Not applicable.	Not applicable.
# of sites where risks are reduced via RAMs	578	471	420
% reduction in the universe of sites where private parties have failed to meet deadlines	22% based on number of default sites as of July 1	16% based on number of default sites as of July 1	15% based on number of default sites as of July 1

‡ Outcomes marked with this symbol are Core Performance Measures.

Outputs	FY 2001 (7/1/00 through 6/30/01)	FY 2002 (7/1/01 through 6/30/02)	FY 2003 (7/1/02 through 6/30/03)
# of Special Project Permits issued	1	4	1
# of Technical Assistance Grants awarded	12	0	0
# of approved RAMs	628	511	457
# of targeted and random comprehensive audits	268 targeted; 64 random	136 targeted; 72 random	150 targeted; 46 random
# of compliance inspections	1,688	1,387	1,245
# of compliance assistance "reminder" letters	907	890	799
# of higher level enforcement actions	150	217	159
# of continuing education credits awarded to LSPs who attended DEP regulatory training	490	1365	180

Trend analysis

- The decrease in the number of LUST cleanups, both initiated and completed, reflects a return to normalcy after a spate of activity in the late 1990s caused by a federal deadline for USTs to upgrade to meet higher safety standards.

- The number of sites permanently cleaned up each year continues a slow decline, reflecting the maturity of the program. The bulk of the cleanup backlog has been eliminated, so the number of sites "exiting" the program is approaching equilibrium.

- The number of sites where risks have been reduced by RAMs has declined because of the slowing economy. RAMs tend to be driven by development considerations.

- In FY 2002 and FY 2003, DEP issued no technical assistance grants. Because of the state's fiscal challenge, no money was allocated for TAGs and the TAG staff was reassigned to work on core program activities.

- Comprehensive audit activity decreased slightly from FY 2002 to FY 2003 because of staff reductions and a commitment to shift resources to ensure that all sites received screening (Level 1) audits.

- The trend in the number of compliance inspections for the PPA performance period reflects the Brownfields Act requirements to audit all sites with Activity and Use Limitations. The decrease in compliance inspections over this period reflects a return to "normal" levels.

- The year-to-year variability in the number of reminder letters and higher-level enforcement actions is indicative of the cyclical nature of these activities rather than particular trends.

The dramatic decrease in the number of LSPs awarded Continuing Education Units (CEUs) in FY 2003 is attributable both to a major investment in training activities in FY 2002 and to disinvestments made because of the budget crisis; BWSC disinvested from direct training activity because resources were limited and its staff was reduced by 15 percent. BWSC conducted only one set of trainings (audits) during FY 2003.

List of References of work products submitted or available

Regulations

- DEP Fees and Program Improvements Regulation Package (http://Mass.Gov/dep/bwsc/regs.htm)

Other Work Products

The following guidance, policies and publications published in FY2002 are available on-line at http://Mass.Gov/dep/bwsc/bwschome.htm.

- Working draft - Gasoline Release Short Form
- Working draft - Updated #2 Fuel/Diesel Short Form
- The Massachusetts Waste Site Cleanup Program: Measures of Program Performance 1993-2001
- WSC #02-411: Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MA DEP VPH/EPH Approach
- Support Documentation: Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MA DEP VPH/EPH Approach
- Draft - Guidance on the Use, Design, Construction, and Monitoring of Engineered Barriers
- QA/QC Guidelines for the Acquisition and Reporting of Analytical Data
- MCP Timelines and Fees fact sheet
- Draft - QA/QC Standards for Physiologically Available Cyanide

Clean Up Waste Sites Operational Goal #3: Increase the rate of cleanup and opportunities for redevelopment of brownfields sites.

What needs to be done

- Create incentives for new parties to clean up and redevelop contaminated sites.

2003 highlights in meeting goal

In 2003, DEP had several successes in advancing this goal.

- The outputs described in Waste Sites Operational Goal #2 apply equally to the rate of cleanup and opportunities for redevelopment of Brownfields sites.

Environmental Indicators and other Performance Measures

Environmental Indicators	FY 2001	FY 2002	FY 2003
At this time, no environmental indicators have been developed for this goal; many states, EPA, and organizations such as the Association of State and Territorial Waste Management Officials (ASTWMO) are working to develop appropriate indicators.			
Outcomes	**FY 2001**	**FY 2002**	**FY 2003**
DEP will consider brownfields outcomes/outputs as part of the next PPA agreement.			
Outputs	**FY 2001**	**FY 2002**	**FY 2003**
DEP will consider brownfields outcomes/outputs as part of the next PPA agreement.			

Trend analysis

Not applicable; no environmental indicators/outcomes/outputs have been identified for this operational goal.

List of References of work products submitted or available

Other Work Products

The work products described in Waste Sites Operational Goal #2 apply equally to the rate of cleanup and opportunities for redevelopment of Brownfields sites.

Clean Up Waste Sites Operational Goal #4: Ensure the sound closure of unlined landfills.

What needs to be done

Ensure the sound closure of unlined landfills.

2003 Highlights in meeting goal

In 2003, DEP had several successes in advancing this goal.

Issued a corrective action design approval , a post closure use permit to the Town of Reading for the construction of a Home Deport and Jordan's Furniture with IMAX Theatre. This is considerable more involved that the typical post closure use for composting, ball fields or parks**.**

Environmental Indicators and other Performance Measures

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
At this time, no environmental indicators have been developed for this goal; many states, EPA, and organizations such as the Association of State and Territorial Waste Management Officials (ASTWMO) are working to develop appropriate indicators. See update on Corrective Action on next page			

Outcomes	FFY 2001	FFY 2002	FFY 2003
# of unlined landfills properly closed with impermeable caps	IN CY01 13.45 acres were capped at active landfills	IN CY02 26.965 acres were capped at active landfills	Data not available
# of landfill sites authorized for reuse for open space and/or recreation	In FFY01, a total of 4 landfill sites were authorized for reuse.	In FFY02, a total of 3 landfill sites were authorized for reuse.	In FFY03, a total of 8 landfill sites were authorized for reuse.

Outputs	FFY 2001	FFY 2002	FFY 2003
# Of consent orders for landfill closure and capping	In 1994, there were 105 landfills in operation and targeted for closure. Since then, all of these landfills have been closed and capped under terms of a consent order for each landfill.		

Trend Analysis

LANDFILL CLOSURE AND CAPPING

All closed landfills in MA have been properly capped.

Operating landfills have active cells that are still receiving waste as well as cells that have been completely filled, and need to be properly closed and capped. Capping is particularly important for landfills without liners, because the cap minimizes the creation of leachate that can potentially contaminate the groundwater. The number of acres of unlined cells at active landfills that have been properly capped has declined precipitously from approximately 151 and 183 in CY 99 and CY00 to 13 acres in CY01. This decline is due to a DEP initiative to identify and ensure the proper closure of these sites. The number should reach zero in future years, as the few remaining

uncapped inactive cells are capped. No new uncapped, unlined cells will be created because all active cells at operating landfills in Massachusetts are required to have liners.

LANDFILL REUSE

From 1999 through 2003, 287 Landfills were authorized for reuse
The number of landfills authorized for reuse has remained relatively constant at 4 –6 over the past three years. We expect this number to increase significantly in the future due to the new innovative public/private partnership we have created to facilitate the conversion of closed landfills to useful recreation or open space.

LDF Section

Corrective Action Trends

DEP completed environmental indicator reviews for 4 facilities in FFY03. Both "human health exposure" and "groundwater migration" controlled criteria were evaluated. In addition, three stabilization measures were reviewed and determined to be appropriate actions at 3 licensed TSDs. DEP certified closure at one TSDFs in FFY02/ The DEP certified post closure and 1 TSDF as part of the move of RCRA Lads into the MCP. It is our hope to transition one additional facilities to the MCP for corrective action in FFY04.

- Number of Facilities where CA [i.e. stabilization measures] implemented: 2
- #of Facilities where Imminent Hazards are being evaluated or controlled: 2
- Environmental Indicators determined:
    - Human Exposure Controlled: 3
    - GW Migration Controlled: 4

Clean Up Waste Sites Operational Goal #5: Ensure the sound closure and cleanup of contaminated sites at licensed and interim-status hazardous waste treatment, storage and disposal facilities

What needs to be done

Assure the clean closure and cleanup of licensed and interim-status hazardous waste facilities.

2003 Highlights in meeting goal

In 2003, DEP had several successes in advancing this goal. These included:

•

Environmental Indicators	FFY 2001	FFY 2002	FFY 2003
Groundwater releases controlled (RCRA related) ‡	➢ 2 -- high priority TSDs	➢ **4 -- high priority TSD**	➢ **0**

Outcomes	FFY 2001	FFY 2002	FFY 2003
Activities targeted at controlling or preventing the spread of contamination, preventing human exposure to such releases, and reducing the risk to human exposure and the environment‡	➢ 1 facility (TSDF) closure plan approval ➢ 1 Immediate Response Action taken to remove solvent DNAPL from catch basins ➢ 1 Hazardous Waste Land Disposal Facility continued hydraulic containment ➢ 2 Indoor air imminent hazard evaluations conducted ➢ 2 split sampling inspections conducted at TSDFs ➢ 1 Stabilization Measure conducted to remove solvent contaminated soils ➢ 1 oversaw state contractor closure of abandoned TSDF to remove hazardous waste	➢ 1 facility (TSDF) closure plan approval and closure certification ➢ 1 Immediate Response Action taken to remove LNAPL from Groundwater ➢ 1 Hazardous Waste Land Disposal Facility continued hydraulic containment ➢ 2 Stabilization Measures conducted to remove solvent contaminated soils	➢ 1 oversaw state contractor removal of over 500 barrels and containers of hw from an abandoned TSDF ➢ 1 RCRA Non Notifier HW disposal ➢ 1 Hazardous Waste Land Disposal Facility continued hydraulic containment and corrective action plan was approved.
Human exposures controlled‡	➢ 2 – high priority TSDs	➢ 3 – high priority TSDs	➢ 2 – high priority TSDs
Resource Conservation and Recovery Act	➢ 1 Stabilization Measure	➢ 3 Stabilization Measures	➢ 1 Oversaw final

‡ Outcomes marked with this symbol are Core Performance Measures.

(RCRA) Corrective Action Sites (areas) cleaned up‡	conducted to remove solvent contaminated soils ➢ 1 oversaw state contractor closure of abandoned TSDF to remove hazardous waste	approved 2 sm's implemented 1 pending NPDES discharge permit approval)	removal of hazardous waste abandoned at HW, TSDF
% of hazardous waste managed at Treatment, Storage, and Disposal Facilities (TSDFs) with approved controls in place‡	100%	100%	100%
# of hazardous waste facilities where corrective actions have been implemented	In 2001, continued corrective action work at 11 TSDs and 10 Hazardous Waste Land Disposal Facilities and 1 closed TSD.	IN FFY02 corrective action implemented at 2 TSDFs	In FFY03, state oversaw closure: 1 Lagoon

Outputs	FFY 2001	FFY 2002	FFY 2003
# of high priority RCRA facilities with human exposure controlled‡	2 facilities	3 facilities	2 facilities
# of high priority RCRA facilities with groundwater releases controlled‡	2 facilities	4 facilities	0 facilities

Trend Analysis

From 2002 to 2003 the work to advance the goal of ensuring the sound closure and cleanup of contaminated sites at licensed and interim-status hazardous waste treatment, storage and disposal facilities has remained fairly stable. Assessment and clean up work has continued at closed TSDFs and hazardous waste land disposal facilities, The number of new sites being identified has also declined sharply since the advent of the program. Workload is expected to gradually decline with time as closure plans at the identified sites get approved and implemented, and few new sites are identified.

‡ Outputs marked with this symbol are Core Performance Measures.

Trends for Inspections and Penalties

DEP uses a variety of tools to identify noncompliance with environmental regulations. These include investigations by DEP's Environmental Strike Force, inspections, reviews of reports and monitoring data, audits, and follow-up to citizen complaints. The table below shows inspections and penalties for each of the past three fiscal years.

Type of Inspection	**2001** (7/1/00 to 6/30/01) Full Year	**2002** (10/1/01 to 9/30/02) Full Year	**2003** (10/1/02 to 9/30/03) Full Year
Cross-media inspections (Environmental Strike Force Investigations)	434	387	270
Multimedia inspections of industrial facilities	634	730	584
Asbestos inspections	1228	938	810
Solid Waste facility inspections*	*	*	488
Other single media inspections of industrial facilities*	597	984	177
Waste site inspections	1688	1210	1470
Resource protection inspections	3015	2199	1986
Resource protection report reviews	53618	64,576	67,012
Certified laboratory inspections	30	37	19**
Type of Result			
Penalties to industrial facilities	$1,912,600	$2,100,206	$1,567,136
Penalties to parties responsible for waste sites	$383,050	$523,588	$2,020,413
Penalties to protect natural resources	$375,361	$595,252	$381,063
Referrals to the Massachusetts Attorney General (MAAG)	27	12	25
MAAG settled cases, civil and criminal	14	23	19
MAAG penalties, civil and criminal	$786,000	$2,133,300	$6,993,125***
Referrals to US EPA and others (municipalities, district attorneys)	1	12	0
Waste Site Cleanup cost recovery revenues	$3,102,2101 (7/1/00-6/30/01)	$1,356,329 (7/1/01-6/30/02)	$561,241 (7/1/02-6/30/03)

* As of the FFY 2003 Mid-year report, DEP has begun reporting Solid Waste facility inspections as a separate category. Formerly, solid waste facility inspections were included in "Other single media inspections."
**This number reflects a staffing shortage at WES during the first half of calendar year 2003. In July 2003 a staff member received certification to conduct laboratory inspections. The program is now on schedule and has completed 35 inspections since July 1, 2003 through February 2004.
***This number is unusually high because of a single $5,900,000 penalty assessed to the Waters Corp. in July 2003.

Accrued Expenditures 10/1/02 Through 9/30/2003

	FEDERAL BUDGET FFY2003	ACCRUED EXPENDITURES
PERSONNEL	$ 5,748,177	$ 6,100,903
FRINGE BENEFITS (@22%/23%)	1,296,662	1,311,340
TRAVEL	68,532	19,823
EQUIPMENT	10,002	45,410
SUPPLIES	115,303	80,315
CONTRACTUAL	3,450,050	1,939,408
CONSTRUCTION	0	0
OTHER	290,975	237,085
TOTAL DIRECT	**10,979,701**	**9,734,284**
INDIRECT CHARGES (@32.76 of Federal Salary Base+Fringe) (@20.64 of State Match Salaries)	3,398,845	3,644,505
TOTAL EXPENDITURES	**$14,378,546**	**13,378,789**

The major portion of the underspending is in the 319 and 104(b)(3) programs. These programs include several multi-year projects.